DOCUMENT RESUME

ED 154 786 IR 005 851

AUTHOR	Parker, Edwin; And Others
TITLE	Information Systems. Technical Report No. 12.
INSTITUTION	Stanford Univ., Calif. Dept. of Communication.
SPONS AGENCY	National Iranian Radio and Television, Tehran.
PUB DATE	Dec 76
NOTE	219p.; For related document, see IR 005 859; Some pages marginally reproducible
EDRS PRICE	MF-$0.83 HC-$11.37 Plus Postage.
DESCRIPTORS	Annotated Bibliographies; *Cataloging; *Data Bases; *Educational Television; *Electronic Data Processing; *Facility Requirements; Information Processing; *Information Retrieval; Needs; On Line Systems; *Specifications; Video Tape Recordings

ABSTRACT

An executive summary (chapter 1) provides an overview of this study to assess the needs and requirements of Educational Radio and Television of Iran (ERTI), and to analyze alternative information systems and services that could be used to facilitate the storage and retrieval of reports, books, films, and tapes in that organization. Chapter 2 includes detailed recommendations for a videotape and film library implemented with a manual card file-based system which would easily permit upgrading to computer-based technology at a later date. Chapter 3 provides detailed recommendations for implementation of the Educational Resources Information Center (ERIC) system and services in the ERTI library. Chapter 4 provides an analysis of ERTI computing requirements and makes recommendations for meeting them with the Micro 4000 system, a hybrid (computer-microform) mini-computer-based system. Four appendices provide detailed documentation of this system. Chapters 5, 6 and 7 review the capabilities of information systems in use at U.S. television networks, at RAI in Italy, at NHK in Japan, at major U.S. film studios, and at major scholarly archives. In addition, an annotated bibliography of background information on film archives likely to be of interest to ERTI librarians and archivists is included. (VT)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED154786

INFORMATION SYSTEMS

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

by

Edwin Parker
Carlo Sartori
Henry Breitrose
Elspeth Elliot

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Bruce B. Lusignan

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

December 1976

Technical Report No. 12
Prepared under
National Iranian Radio and Television Contract
NIRT No. 1

COMMUNICATION DEPARTMENT
Stanford University
Stanford, California

IR005851

TABLE OF CONTENTS

INFORMATION SYSTEMS

I. EXECUTIVE SUMMARY..... 1

A. VIDEOTAPE AND FILM ARCHIVE..... 2

B. ERIC SYSTEM..... 2

C. COMPUTING REQUIREMENTS..... 3

D. BACKGROUND INFORMATION..... 3

II. RECOMMENDATIONS FOR VIDEOTAPE AND FILM LIBRARY..... 4

A. VIDEOTAPE STORAGE..... 4

1. Pre-Broadcast..... 4

2. Post-Broadcast for Scheduled Re-Run..... 7

3. Post-Broadcast for Unscheduled Re-Run..... 8

4. Revision..... 8

B. CLIMATE CONTROL..... 8

C. FLIM STORAGE AND RETRIEVAL(STOCK FOOTAGE)..... 9

1. Color Degradation..... 9

2. Film Use Flow Chart.....10

3. Film Use.....10

4. Procedures for Submitting Out-Takes to Library.....11

5. Procedures for Submitting Program Elements to Library.....11

D. CATALOGING SHOTS.....13

1. Cataloger's Role.....15

2. Coder's Role.....15

3. Filing.....,20

4. User Search Procedure.....20

5. User Utilization Procedure.....21

TABLE OF CONTENTS (CONT)

E. STAFF TRAINING..... 21

1. Librarian..... 21

2. Deputy Librarian..... 22

3. Video Tape Supervisor..... 22

4. Film Supervisor..... 23

5. Chief Cataloger..... 23

6. Coders, Clerks, Secretaries..... 23

F. SPACE AND EQUIPMENT..... 25

III. RECOMMENDATIONS FOR TRANSFERRING THE ERIC SYSTEM TO NIRT. 26

A. OBTAIN INDEXES AND THESAURUS FOR ERIC COLLECTION..... 26

B. PROCUREMENT OF ERIC MICROFICHE COLLECTION AND SUBSCRIPTION TO STANDING ORDER FOR ERIC MICROFICHE... 26

C. PROVIDE STORAGE FACILITY FOR ERIC MICROFICHE..... 26

D. OBTAIN MICROFICHE READERS..... 27

IV. MEETING ERTI COMPUTING REQUIREMENTS

A. MANUAL VS COMPUTER SYSTEMS..... 40

B. SPECIAL-PURPOSE VS GENERAL-PURPOSE COMPUTING..... 40

C. COMPUTING VS HYBRID SYSTEMS..... 41

D. THE CBS/NBC SYSTEM..... 42

E. THE MICRO 4000 (WITH MICROS SOFTWARE)..... 43

F. APPLICATION TO ERTI..... 43

G. ERTI GENERAL COMPUTING REQUIREMENTS..... 45

H. STAFFING, TRAINING, IMPLEMENTATION..... 46

V. U.S. VIDEO LIBRARIES: BACKGROUND DESCRIPTIONS..... 47

A. OVERVIEW..... 47

1. Production-Oriented Television Archives..... 47

TABLE OF CONTENTS (CONT)

2. Conventional Film Studios..... 48

3. Scholarly Archives..... 49

B. SITE VISIT REPORTS: INTRODUCTION..... 51

C. CBS NEWS..... 51

1. Production-Oriented Television Archive..... 51

2. Film Retrieval Inventory Control Operations..... 54

3. Summary..... 60

D. PRODUCTION-ORIENTED TELEVISION ARCHIVE: NATIONAL BROADCASTING COMPANY..... 60

1. Commercials..... 61

2. News..... 61

3. Cataloging..... 62

4. Personnel..... 63

5. Summary..... 63

E. CONVENTIONAL FILM STUDIO: UNIVERSAL STUDIOS..... 64

1. Temperature and Humidity Factors..... 64

2. Basis of Collection..... 65

3. Cataloging..... 66

4. Retrieval..... 66

5. Staff..... 66

6. Summary..... 67

F. CONVENTIONAL FILM STUDIO: MGM STUDIOS..... 68

1. Cataloging..... 69

2. Retrieval..... 69

3. Care..... 69

4. Staff..... 69

TABLE OF CONTENTS (CONT)

5. Additional Information..... 69

6. Summary..... 70

G. SCHOLARLY ARCHIVE: NATIONAL ARCHIVES

1. Cataloging..... 71

2. Physical Presentation..... 72

3. Staff..... 73

4. Summary..... 73

H. SCHOLARLY ARCHIVE: LIBRARY OF CONGRESS

1. Cataloging Procedure..... 74

2. Staff..... 75

3. Building..... 76

4. Inspection..... 76

5. Summary..... 76

VI. ITALIAN AND JAPANESE SYSTEMS

A. ITALIAN (RAI) SYSTEM..... 77

1. Introduction..... 77

2. The Structure of the System..... 77

3. Characteristics and Advantages of the System.... 80

4. History and Evolution of the System..... 82

B. JAPANESE (NHK) SYSTEM..... 83

1. Film Library

2. Physical Storage

3. Summary

VII. ANNOTATED BIBLIOGRAPHY..... 86

APPENDIX 1: The Micro 4000..... 98

TABLE OF CONTENTS (CONT)

APPENDIX 2: MICROS CONCEPTS/CAPABILITIES.....104

APPENDIX 3: MICROS TECHNICAL SUMMARY.....121

APPENDIX 4: NBC USER MANUAL FOR
MICRO 4000 SYSTEM.....129

Chapter I
Executive Summary

This report presents the results of Task B-5, "Preparation of analysis of information systems and services that could be used to facilitate the storage and retrieval of reports, books, films and tapes" of the contract between Stanford University and National Iranian Radio Television. The contract task description is as follows:

> The U.S. Education Resources Information Center (ERIC) Clearinghouse for Information Resources is located at Stanford. Stanford will assist NIRT to develop a central archive for educational information. The Stanford library automation system (BALLOTS), which utilizes the system software of SPIRES (Stanford Public Information REtrieval System), is considered by many to be the most effective automated library system anywhere. Stanford has just completed a study for the National Science Foundation comparing the eleven major on-line computer information systems in the U.S. This background of experience and information will be drawn upon to provide an evaluation of alternative ways of providing such services in Iran for NIRT to use in an internal archive of NIRT materials and as an easier way of learning the existence of obtaining access to audio, video, and print materials not included in NIRT's archive.

In carrying out this task, the project team reviewed the existing status of Educational Radio and Televison of Iran (ERTI), its organization, staff capability and existing and planned physical facilities. Needs and requirements were assessed independently of whether computer technology systems were appropriate solutions. Specific handling requirements of the organization were taken into account. Immediate implementation of a manual archive system is recommended, but in a form that can be readily converted to a computer system when it becomes available. Procurement of the U.S. ERIC system is recommended as a means of quickly building a research library of educational research materials in English to which Farsi literature can be added as it becomes available. Analysis of ERTI computing requirements led to the recommendation the the computer-based system in use at two major U.S. television networks (CBS and NBC) be installed at ERTI for specialized archive and library retrieval applications. Other ERTI computing requirements can be met on the central NIRT computing facility.

A. VIDEOTAPE AND FILM ARCHIVE

Chapter II includes detailed recommendations for a videotape and film library (archive). It appears that there is an urgent need to implement the archive immediately on a manual basis with resources presently available, even though the archive may be later upgraded to include computer-based and microform-based technology. These detailed recommendations are for a 'manual' card file-based system that is immediately implementable, but which will easily permit upgrading to computer-based technology at a later date.

It would be appropriate for ERTI to implement these recommendations within a "Production Archives Division" of the ERTI Production Department. Stock film should be cross indexed shot by shot and stored to provide producers ready access to footage available from previous activities. The broadcast tape archives should store master television tapes for broadcasting and revision. Currently, broadcast tapes are kept at NIRT central facilities, but these are seriously overcrowded. Films are kept by the producers and are not readily available to others. Space will be available in the new ERTI building for the archive, including storage racks, viewing machines and office space.

Ten staff positions for the production archive should be filled in the next year. They are:

Position	Number
Archivist	1
Deputy Archivist	1
Video Tape Supervisor	1
Film Supervisor	1
Chief Cataloger	1
Coders, Clerks, Secretaries	5
Total	10

It is recommended that the archivist be sent to CBS New York for training.

B. ERIC SYSTEM

Chapter III provides detailed recommendations for implementation of the Educational Resources Information Center (ERIC) system and services in the ERTI library. This section includes instructions and

order forms for obtaining the complete set of research reports available on microfiche from ERIC as well as subscriptions to continuing services. The ERIC Clearinghouse on Information Resources at Stanford University is scheduled to move to Syracuse University in 1977. Continuing assistance in connection with ERIC implementation, if desired, is likely to be available from the Syracuse University ERIC Clearinghouse. Chapter III also provides detailed information on necessary storage facilities and microfiche readers.

C. COMPUTING REQUIREMENTS

Chapter IV provides an analysis of ERTI computing requirements and makes recommendations for meeting them. The Micro 4000 system (with Micros software) marketed through Kodak is recommended as a hybrid (computer-microform) mini-computer-based system to meet most specialized retrieval and inventory control requirements within ERTI. This system is used successfully at two of the three U.S. commercial television networks, CBS and NBC. It permits computer retrieval of references to video materials including descriptions and storage locations. It also permits retrieval on a microform display of the contents of the script or other paper documents associated with each film or videotape. Four appendices provide detailed documentation of this system. ERTI's general purpose computing requirements (primarily for Fortran programs and statistical analyses) can be met by the central NIRT computer facility.

D. BACKGROUND INFORMATION

In preparing the information system recommendations the Stanford team reviewed the capabilities of information systems in use at U.S. television networks, at RAI in Italy, at NHK in Japan, at major U.S. film studios and at major scholarly archives. In addition an annotated bibliography of background information on film archives was prepared. This background information is likely to be of interest to ERTI librarians and archivists, and is included in Chapters V, VI and VII.

Chapter II
Recommendations for Videotape and Film Library

A. VIDEOTAPE STORAGE

This section is concerned with examining and recommending procedures for storage of videotaped programs. In an instructional television production facility, such as that at NIRT we can identify four modes of storage:

1. Pre-broadcast (after production, but prior to initial broadcast)
2. Post-broadcast for scheduled re-run
3. Post-broadcast for unscheduled re-run
4. Post-broadcast for revision

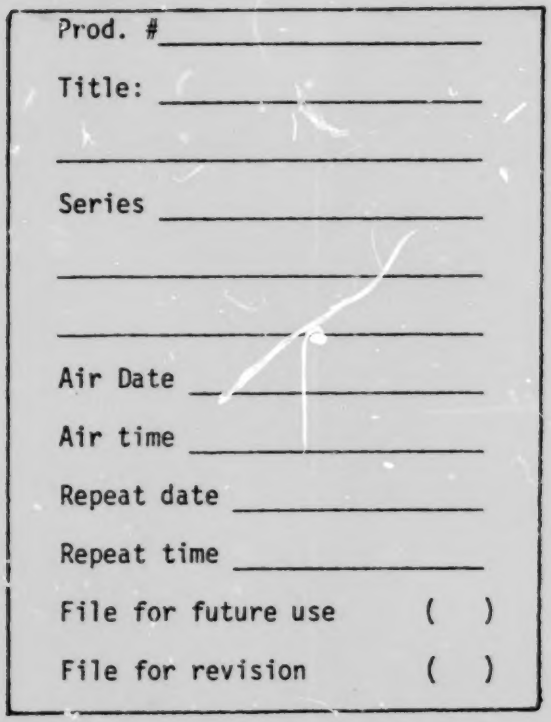
1. Pre-Broadcast

Typically, programs produced on videotape for instructional purposes are completed long before their first air-date. Certain special situations may prevent the completion of a program until very close to the air date, but we would recommend that production be scheduled so that programs are completed no later than four weeks prior to air-date.

Each videotape should, upon its completion, be sent to the traffic director or director of scheduling who shall be responsible for identifying its first air-date and its repeat air-date(s). We recommend that self-adhesive labels be prepared in duplicate, that one label be placed on the videotape container and that the second lable be placed directly on the tape reel.

Figure 1

Specimen label



It shall be the responsibility of the Traffic Director or Director of Scheduling to make certain that all of the appropriate information is entered on the program label.

The Traffic Director, or Director of Scheduling, shall then send the labeled tape to the library where it shall be logged in. No tape may arrive in or leave the library without being entered in the log. The log shall be chronological.

Figure 2

Specimen Log:

Date	Prod. #	Title	Series	Signature
1/1/76	76004-101	Sanitation	Rural Life	
1/1/76	76125-102	Counting	Elementary Math	
1/1/76	76042-103	Equator	Elementary Geography	

The logging in or out of all materials is to be supervised by a single person who will be solely responsible and accountable for this work.

After the tape is logged in, two inventory cards shall be prepared: a Master Inventory Card which will be filed according to production number and a Locator Card, which will be filed according to series title and program title within series. All programs not part of a series will be regarded as series.

Figure 3

Specimen Master Inventory Card

76004-123

Prod. #

Series Title Rural Life

Date of Production 1/1/76 Program Title Sanitation

Air date 3/5/76 Air time 1130 hrs

Repeat date 3/12/73 Repeat time 1700 hrs

Disposition:

File for future use (x)

File for Revision ( )

Removed From Library			Returned to Library	
Date	Reason	By	Date	By
3/5	Broadcast	HSB	3/6	HSB
3/12	Broadcast	HSB	3/13	HSB

Figure 4

Specimen locator card:

RURAL LIFE / Sanitation	
Series Title	Program Title
Prod. # 76004-124	

The librarian who prepared the inventory cards will then put the program on a shelf which shall be identified by date and time of broadcast. One group of shelves, capable of accommodating approximately 200 program tapes shall receive programming scheduled for broadcast. The tapes shall be arranged by date of broadcast, and within broadcast date, by time of broadcast. In the event that a specific time is scheduled for a re-broadcast then a yellow "dummy" shall be placed in that time niche. The "dummy" shall carry on it the production number, series titled and program title of the program to be broadcast at that time.

All other program tapes shall be filed sequentially by production number. A two part number representing both the tape sequence number and the production number can be used, consistent with NIRT practice.

2. Post-Broadcast for Scheduled Re-Run

The videotape supervisor shall be responsible for removal of all tapes for broadcast from the library and their delivery to the appropriate videotape machine. Upon completion of their transmission they shall be re-wound and returned to the library. All tapes indicating on their labels a subsequent re-broadcast time shall be placed in the niche assigned to their indicated re-broadcast date and time and the yellow "dummy"indicating their placement shall be removed from the rack.

All tapes which are not specified as to their rebroadcast time shall be filed in order of their production numbers.

3. Post -Broadcast for Unscheduled Re-Run

This mode of storage shall be in racks by production number, the same for all tapes not carrying a scheduled re-run time. At such time as they are re-scheduled, the Traffic Director or Director of Scheduling shall make new labels indicating new air dates and repeat dates. They shall be given to the librarian who shall be responsible for the re-labeling of the tapes, at which point they will be treated precisely as Pre-broadcast tapes.

4. Revision

In the event that a tape is removed from the library for revision, written authorization from a senior official shall be given to the librarian before the tape can be released. The authorization shall be stapled to the back of the Master Inventory Card, which shall be maintained in the file.

Another category of "revision" is the erasure and re-use of a tape. Again, erasure is to be accomplished only upon written authorization of a senior official, and all other procedures will be the same as for the "revision" category above.

B. CLIMATE CONTROL

It is recommended that the interior temperature of the library be maintained at a temperature of 68-72 degrees fahrenheit with a relative humidity of 50 to 60%. While not approaching archival conditions, this should be sufficient to provide reasonable storage for the useful life of each tape, which we estimate as 3 to 5 years, maximum.

Other physical conditions:

Dust and grit are very hard on tape and cause great problems with magnetic playback heads of videotape machines. We recommend that the air supply be filtered, that smoking be prohibited in the library and the videotape machine rooms, and that all possible precautions be taken to assure clean and dust-free conditions. Ideally, precipitators and humidistats in the central air supply would be appropriate.

C. FILM STORAGE AND RETRIEVAL (STOCK FOOTAGE)

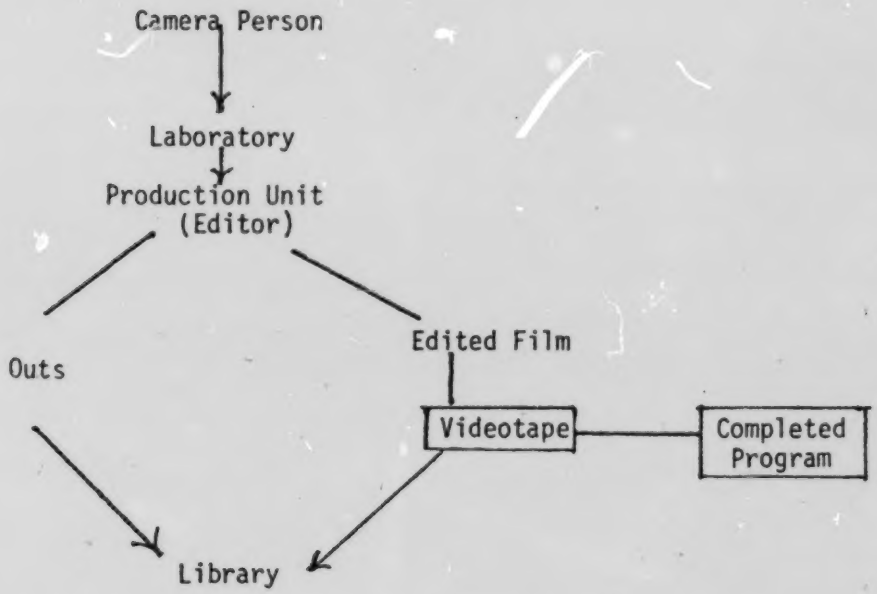
The production of instructional television program often includes motion picture materials which are made for inclusion in videotaped programs. This footage typically is shot on 16mm color reversal motion picture film. The tradition in television is that the sound is recorded on a magnetic stripe on the camera original. From time to time the sound may be recorded separately on another recording device, and the sound and picture are played back in synchronization.

1. Color Degradation

The dyes used in color motion picture film deteriorate with age. This process may be slowed by lowering the storage temperature to ca. 40 degrees farenheit, but unless there is a clear need for long-term archival storage we believe that the investment in purpose-built film vaults is inappropriate for an instructional television production facility. We would recommend that for material of significant historical value, storage arrangements be made with the National Film Archive in Tehran. We recommend that for the bulk of the material a life-span of 3-5 years be accepted and that the film material share the same physical facilities as the video-tape.

2. Film Use Flow Chart

Figure 5



3. Film Use

Film is shot by the camera person, who then delivers the film to the processing laboratory. The laboratory processes the film and the processed film then goes to the production unit where decisions as to what portions of the film are to be used in the final program are made by the film editor. The film editor's work results in two categories of film: "Out-takes" and "Program elements." The out-takes are not needed for the particular program and may be sent directly to the library. The program elements are typically transferred to videotape in a telecine room. Subsequent to their transfer the film elements can be sent to the library.

4. Procedures for Submitting Out-Takes to Library

All out-takes shall be spliced together by the production unit editor on 2 inch cores. The film rolls are not to exceed 1200 feet in length. Ten feet of blank leader shall be spliced to the beginning and end of the roll. The blank leader shall be marked indicating whether it is the beginning or end of the roll ("head" or "tail") and the program production number. Also clearly indicated should be the notation "Out-takes." The editor shall make no decisions as to which out-takes are "worth saving" and all film not constituting program elements shall be treated as out-takes. All "double system" materials in which picture and sound are recorded separately shall be assembled in synchronization on separate rolls, and an editorial or "dead-sync" mark shall be appropriately indicated on picture and sound rolls.

The film cans shall have a label similar to the specimen as shown in Figure 6.

5. Procedures for Submitting Program Elements to Library

After transfer to videotape it shall be the responsibility of the editor to place the program element film on a 2-inch core on a roll not to exceed 1200 feet in length. The program element shall carry ten feet of blank leader at its beginning and end, on which shall be indicated "beginning" or "end," production number, and the clear notation "Program Element." The program element shall be treated precisely as out-takes in that it shall be placed in a can with an appropriately marked can identification label. The program element shall be sent directly to the library.

Figure 6

Can Identification Label

Prod. # _____

Can # _____

Program ( )

Out-takes ( )

Mute picture ( )

Composite Mag. ( )

Separate picture ( )

Separate Mag. ( )

Editor _____

Cameraperson _____

Date _____

Program title _____

_____

Series Title _____

_____

_____

D. CATALOGING SHOTS

A shot is defined as all of the film exposed during any single camera run or take. In other words, a shot is registered from the time the camera person switches the camera on until he switches the camera off. Many shots may occur on the same roll of film. Typically, when the film is edited for the program element the shot will be the run of film between any two consecutive splices. The shot is the basic unit of cataloging.

Upon arrival in the library the film can shall be logged in, in the same manner that a videotape is logged in. The can shall be given to a film cataloger. The cataloger shall be equipped with a motorized film viewing machine such as the Steenbeck ST 1600. It is difficult to estimate the number of viewing machines needed without firm data on the amount of film to be handled, but we estimate a minimum of three machines: two for cataloging and a third which can be used by producers for viewing film.

The cataloger shall list every shot on a cataloging form similar to the specimen which follows in Figure 7. When negatives are used, the negative should remain with the NIRT central laboratory processing facility. The ERTI production archive will retain the work print.

Figure 7

Stock Footage Catalog Worksheet

Prod. # 76004 A Series: Rural Life

Date: 1/1/76 Program Title Sanitation

Stock: 16 Color

Footage	Description
0 - 22	LS Trencher excavating near Shiraz
22 - 39	MS Workers installing sewer line with Shiraz in Background
39 - 62	LS Trucks with sewer pipe arriving at work site near Shiraz.
	etc.

1. Cataloger's Role

The cataloger's role is to list, succinctly and accurately, precisely what is seen on the screen of the viewing machine, and to detail 1) what is happening, and 2) where it is occuring. In the event that any recognizable public persons appear on the screen and their names are known, the names shall be listed as well. In short, the cataloger should specify who, what, and where. Standard cinematic descriptors such as LS (Long Shot), MS (Medium Shot) and CU (Close-up) may be used.

Once the catalog sheet is completed, the film can may be placed in the library on a storage rack in order of production number. In the event that a production produces more than one can of film, the various cans shall be identified uniquely by the addition of a letter after the production number, so that, for example, if there are six cans of film generated as a result of the filming on production 76004 they shall be identified as 76005A, 76004B, 76004C, 76004D, 76004E, and 76004F.

2. Coder's Role

The catalog sheet shall then be sent to a coder, whose task is to generate one index card for each significant descriptor on the sheet, and to identify the location of the material described by production number and location on the roll of film. General practice is for the coder to first circle the significant descriptors, and then to type cards. Decision as to which descriptors are significant and which are irrelevant come with practice. In all cases we strongly advise coders to err on the side of completeness and consistency. It is imperative that the work of the coder be supervised carefully, and it is our recommendation that the senior person in the library take direct and personal responsibility for the supervision and training of stock shot coders, and that this be

done by continual sampling of the catalog sheet after circling of significant descriptors by the coder.

Figure 8 indicates appropriate coder circling of significant descriptors on the catalog coding worksheet.

Figure 8

Stock Footage Catalog Worksheet

(Significant Descriptors Circled)

Prod. # 76004A Series Rural Life

Date: 1/1/76 Program Title Sanitation

Stock 16 Color

Footage	Description
0 - 22	LS Trencher excavating near Shiraz
22 - 39	MS Workers installing sewer line with Shiraz in Background
49 - 62	LS Trucks with sewer pipr arriving at work site near Shiraz
	etc.

After the coder completes the identification and circling of significant descriptors on the catalog worksheet, a 3 x 5 inch card is to be prepared for each descriptor, indicating the shot description in which the descriptor occurs and the location of the shot, by production number, film roll number and footage from the first frame of the first shot on the roll.

Specimen descriptor cards for the previously illustrated catalog worksheet follow:

Figure 9

Descriptor Cards

EXCAVATING

LS Trencher excavating near Shiraz

Location 76004 0-22 feet

SEWER

MS workers installing sewer line with Shiraz in background.

Location 76004A 22-39 feet

SEWER

LS trucks with sewer pipe arriving at work site near Shiraz.

Location: 76004A 39-62 feet

SHIRAZ

LS Trencher excavating near Shiraz

Location 76004A 0-22 feet

SHIRAZ

MS Workers installing sewer line with Shiraz in background.

Location 76004A 22-39 feet

SHIRAZ

LS trucks with sewer pipe arriving at work site near Shiraz.

Location 76004A 39-62 feet

TRENCHER

LS Trencher excavating near Shiraz.

Location 76004A 0-22 feet

TRUCKS

LS Trucks with sewer pipe arriving at work site near Shiraz,

Location 76004A 39-62 feet

WORKERS

MS Workers installing sewer pipe with Shiraz in background.

Location 76004A 22-39 feet

3. Filing

Stock Footage Catalog Worksheets are to be filed in order of production number and alphabetically by series and by title within series. The worksheets with significant descriptors circled should be photocopied in duplicate and a "master copy" should be stored with the director of the library. One of the photocopies should be filed in ascending order of production number and the other alphabetically by series and title. The descriptor cards shall be filed in strict alphabetical order. Within the same descriptor designation the cards shall be filed in ascending order of production number. Within the same production number the descriptor cards shall be filed in ascending order of footage count.

4. User Search Procedure

A user may access the file in one of two modes. If the user remembers the title of the program in which desired footage appears then

he may consult the Stock Catalog Worksheet which has been filed alphabetically. If the user can ascertain the production number of a program containing the desired footage then he may consult the Stock Catalog Worksheet which has been filed by production number.

In the event that a user is unaware of a program in which the desired footage has been used then he may consult the descriptor card file to locate the material for possible future use.

5. User Utilization Procedure

Having located footage for use in a new program the user shall request that a videotape copy or a B-Wind Master film copy of the material be generated. Under no circumstances shall footage stored in the library be cut out for use in new programs. The order for copying shall be given to the senior librarian who shall personally be responsible for sending the material for duplication.

All material leaving the library for whatever purpose, including duplication, shall be logged out in the same manner as videotape, and subsequently logged back in upon its return.

E. STAFF TRAINING

1. Librarian

It is imperative that the senior librarian have some theoretical and practical background in the storage and retrieval of non-print materials. While the present design for the film and tape library is relatively simple and depends wholly on manual procedures, strict adherence to procedure, the ability to adapt procedures to changing circumstances, and

the possible conversion to some sort of computer-assisted retrieval system within the next five years demands a person of exceptional quality.

We would suggest that a person with training in librarianship and archive maintenance be found, and that arrangements by made to attach this person to an on-going film and tape production library facility. From our previous study we conclude that the most appropriate organization for attachment would be CBS News in New York. CBS has by far the most sophisticated system in use and their senior librarian, Mr. Sam Surrat, has an excellent background in archive design and management. We believe that a carefully chosen person with a good librarianship degree should spend from 6 to 9 months attached to the CBS News library.

2. Deputy Librarian

We recommend that a Deputy Librarian holding a certification in librarianship be chosen, and that eh or she be trained at NIRT - Education by the Librarian. It should be made clear to the Librarian that his or her first responsibility is the adequate training of the deputy. Additional appropriate training for the deputy librarian would be an attachment of 3 to 6 months with a production unit at NIRT - Education as an apprentice film editor so that he or she can become intimately knowledgeable about the actual production process.

3. Video Tape Supervisor

We recommend that the videotape supervisor be a person with a good secondary diploma who has demonstrated technical and administrative skills. Appropriate training would be a period of 3 to 6 months as an

assistant in the videotape editing and playback section of NIRT so as to acquaint the videotape supervisor with be actual handling of videotape for broadcast purposes.

4. Film Supervisor

The film Superviso ideally should be an experienced film editor who has knowledge of the techniques and traditions of film handling. It is important that the supervisor understand the problems of program producers as well as the demands of strict adherence ot library procedures, and that he or she be able to supervise the work of the catalogers and coders.

5. Chief Cataloger

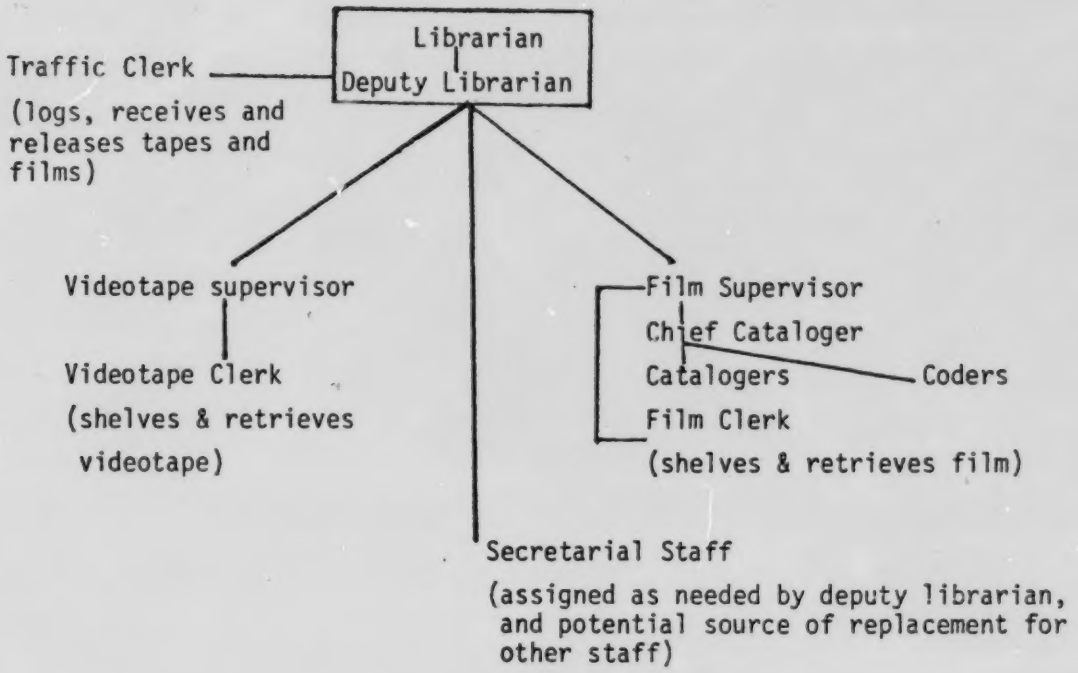
The responsibilities of the chief cataloger require knowledge of film handling as well as librarianship. We recommend that a person with library cataloging experience be chosen, and that this person spend a period of 3 to 6 months as an apprentice film editor with an NIRT production unit.

6. Coders, Clerks, Secretaries

These tasks require some education, probably equivalent to good secondary diplomas, together with a demonstrated ability to learn and adhere to new procedures. Appropriate training would be on-the-job, under the direct supervision of the Film Supervisor and the Librarian.

Figure 10

Table of Personnel Organization



F. SPACE AND EQUIPMENT

The recommended arrangements for utilization of space in the new ERTI building are presented in the "blueprint" attachment included in the pocket inside the back cover of the report. Equipment recommendations are presented in Table 1. The storage capacity is planned for 3500 hours of video material, which is at least 5 years of production at the ERTI maximum annual capacity of 700 hours per year.

Table 1

Equipment Recommendations

FILM VIEWING MACHINES

We recommend console film viewing machines with a capability of running the following configurations of 16 mm film:

1. Silent
2. Composite Magnetic
3. Composite Optical
4. Separate Magnetic

Such machines are manufactured by Steenback, Magnasync/Moviola, KEM, and several other manufacturers. We recommend that the library choose machines of the same manufacturer as those machines used by the production facility. Advantages of one manufacturer over another would be more than offset by interchangeability of spare parts with other NIRT machines and the presence of maintenance people familiar with the machines.

FILM AND VIDEOTAPE RACKS

We recommend freestanding racks, single and double faced, as indicated in the schematic drawing as shown in the Attachment. Several manufacturers can supply appropriate racking, but we recommend serious consideration of the AMES TD90S range because of easy conversion of shelf elements to accomodate videotapes or film cans, and the design of shelf dividers. This line is manufactured by the Hallowell Division of Standard Pressed Co. in Hatfield, Pennsylvania.

SAFETY CONSIDERATIONS

Because of the weight and loading of the racks, it is imperative that the racks be attached to the floor, either by grouted studs or expansion bolts with high shear-strength.

Chapter III

Recommendations for Transferring the ERIC System to NIRT

This section includes the information needed to establish at NIRT the complete set of education research reports available on microfiche from ERIC.

In order to effect a speedy and efficient implementation of the ERIC system in the ERTI library at NIRT, we recommend the following steps.

A. OBTAIN INDEXES AND THESAURUS FOR ERIC COLLECTION

The indexes to the ERIC Collection appear monthly as a journal, called Research in Education. In order to have indexes and a Thesaurus to complete the collection, fill out the attached purchase orders to Macmillan Information (Sample 1), National Standards Association (Sample 2), and the Moore Cottrell Subscription Agency (Sample 3).

Storage consisting of one 4' x 8' library shelving unit must be available for the collection of indexes.

B. PROCUREMENT OF ERIC MICROFICHE COLLECTION AND SUBSCRIPTION TO STANDING ORDER FOR ERIC MICROFICHE

The accompanying purchase order as shown in Sample 4 should be authorized and transmitted with accompanying funds in United States dollars to:

ERIC Document Reproduction Service
P.O. Box 190
Arlington, Virginia 22210

The purchase order for $13,710.61 covers:

1. The complete ERIC microfiche collection (1966-1975): $11,730.61.
2. The cost of shipping same to Iran: $180.00.
3. The cost of a current subscription to the ERIC collection (1976): $1,800.00.

C. PROVIDE STORAGE FACILITY FOR ERIC MICROFICHE

The ERIC microfiche collection must be stored at a temperature not to exceed 75°F, with a humidity range between 15 to 75 per cent. A

storage area at least 200 sq. ft. in area, with the stipulated temperature and humidity control, should be arranged for.

Storage cabinets for the ERIC microfiche should be purchased or constructed. Five 10-drawer units, with space for 2 rows of 4" x 6" cards, are necessary to house the collection and provide ample storage for the 1976-1977 materials to come.

These storage units should be as similar to the ones described in Table 1. The estimated cost of purchase in the U.S. from BroDart Corporation would be $2,797.50 FOB New York. A survey should be made to determine if the most cost effective procedure would be to:

1. order cabinets from a U.S. supplier, or
2. order cabinets from an Iranian supplier, or
3. build cabinets at the storage site.

D. OBTAIN MICROFICHE READERS

Two microfiche readers to view the ERIC microfiche should be purchased. The readers should be capable of handling a 24x reduction of 4" x 6" NMA standard microfiche. The readers should be purchased from a source which would also be prepared to supply spare parts and repair service if possible. Microfiche readers generally do not break down, but do need regular replacement of the electric bulb which supplies their light source. A supply of bulbs should be purchased if no Iranian source can guarantee their continuing availability. These microfiche readers should cost between $200-$300 each.

Figures 1 and 2 show a suitable reader which is available from the 3M Corporation. The Iranian dealer for this product is:

Shabrang Company
367 Takhte Jamshid Ave.
Teheran, Iran

Eastman Kodak makes a similar readers as shown in Figures 3, 4, 5 and 6. The Iranian dealer for Eastman Kodak products is:

Haffo Co.
210212 Avenue Shah
Teheran, Iran.

Sample 1

MACMILLAN INFORMATION

Order Information:

Mail to:

MACMILLAN INFORMATION
A Division of Macmillan Publishing Co., Inc.
200 D Brown Street
Riverside, New Jersey 08075

Please send me the following:

CURRENT INDEX TO JOURNALS IN EDUCATION

- ☐ Monthly Index (46933) — $56.00 per yea
- ☐ Monthly Index plus Semiannual Cumulations (46896) — 100.00 per year
- ☐ Semiannual Cumulations only (46897) — 50.00 per year

ERIC REFERENCE MATERIAL

ERIC Educational Documents Abstracts

- ☒ 1968 (46867) ☒ 1969 (46868) ☐ 1970 (46869)
- ☒ 1971 (46870) ☒ 1972 (46871) ☐ 1973 (46881)
- ☒ 1974 (46814) ☒ 1975 (69301)

$50.00 per volume

ERIC Educational Documents Index

- ☒ 1966-1969 (2 vol.) (46875) — $60.00
- ☒ 1970-1971 (46878) ☒ 1972 (46879)
- ☒ 1973 (46883) ☒ 1974 (46816)
- ☒ 1975 (69300) — $35.00 per volume
- ☐ ERIC Educational Documents Index--Institutions 1966-1971 (46884) — $15.00

ERIC BIBLIOGRAPHIES

- ☐ Career Education (46825) — $ 9.95
- ☐ Early Childhood Education (46850) — 9.95
- ☐ Educational Finance clothbound (46887) — 8.95
- ☐ Educational Finance paperbound (46888) — 5.95
- ☐ ERIC Information Analysis Products 1967-1972 (46882) — 14.95
- ☐ Library and Information Sciences (46863) — 9.95
- ☐ Reading: An ERIC Bibliography 1970-1972 (46934) — 9.95
- ☐ Social Studies and Social Science Education (46984) — 9.95

Thesaurus of ERIC Descriptors 7.96

Enclosed is my _ check _ money order for $_____

Name_____

Title_____

Institution_____

Address_____

City_____State_____ZIP_____

Sample 2
National Standards Association

Other ERIC Products

RESEARCH IN EDUCATION—REPORT RÉSUMÉS
November 1966—December 1967

The National Standards Association has reprinted in one volume the Report Résumés which appeared in the first 14 issues of *Research in Education* beginning November 1966 and ending December 1967. These issues of RIE are no longer available through the Government Printing Office.

There are 2,349 documents abstracted in this volume with identification numbers ED 010 000 to 012 348.

Copies of Report Résumés are available for immediate delivery and are sent postpaid. The price is $24.50 a copy.

Indexes to the Report Résumés are contained in the Annual Index 1967. Contents include author indexes, institutions indexes, subject indexes, and accession number list. The price is $3.25 a copy.

To order you may use the following form:

National Standards Association, Inc.
1321 14th Street, N.W.
Washington, D.C. 20005

I am enclosing $_____ (check or money order) for the following:

☐ *Research in Education* Report Résumés November 1966-December 1967, $24.50

☐ *Research in Education* Annual Index 1967, $3.25

☐ *Research in Education* Report Résumés and Annual Index 1967, $27.35

Name _____

Address _____

City _____ State _____ Zip Code _____

Sample 3

Moore-Cottrell Subscription Agency

TO:

Moore- Cottrell Subscription Agencies
North Cochocton, New York 14868

FROM:

National Iranian Radio and Television

Please enter a subscription for Resources in Education available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Resources in Education	
Yearly Subscription (Foreign)	$53.40
Semi Annual Indexes	14.10
Total	67.50
5% handling charge	3.38
Grand Total	$70.88

Sample A

ERIC

DOCUMENT REPRODUCTION SERVICE

P.O. Box 190 ARLINGTON, VIRGINIA 22210 • (703)841-1212

OPERATED BY: COMPUTER MICROFILM INTERNATIONAL, CORP.

SHIP TO: _____

BILL TO: _____

ED NUMBER	NO. OF COPIES MF	NO. OF COPIES HC	UNIT PRICE	TOTAL

IMPORTANT INSTRUCTIONS

- ORDER BY ED NO. (6 DIGITS)
  See Resources in Education
- SPECIFY EITHER:
  Microfiche (MF)
  or
  Paper Copy (HC)
- ENTER UNIT PRICE
  (See Reverse Side)
- INCLUDE POSTAGE
  (See Reverse Side)
- ENCLOSE CHECK or MONEY ORDER
  (American Currency Only)
- MAIL TO:
  EDRS
  P.O. Box 190
  Arlington, Virginia 22210
- COMPLETE AND SIGN BELOW

SUB TOTAL	
SALES TAX	
POSTAGE	
TOTAL	

TAX EXEMPT NO. _____

PURCHASE ORDER NO. _____

DEPOSIT ACCT. NO. _____

Date _____

Signature _____

Title _____

REVISED: JUNE 10, 1975

Sample A

UNIT PRICE SCHEDULE

MICROFICHE (MF)		PAPER COPY (HC)	
NUMBER FICHE EACH ED #	PRICE	NUMBER PAGES EACH ED #	PRICE
1 to 5	$ .76	1 to 25	$1.58
6	.92	26 to 50	1.95
7	1.08	51 to 75	3.32
8	1.23	76 to 100	4.43
Each additional microfiche	.158*	Each additional 25 pages	1.27
**Postage: $.18 for up to 60 microfiche $.08 for each additional 60 fiche		**Postage: $.18 for first 60 pages $.08 for each additional 60 pages	

*TOTAL PRICE SHOULD BE ROUNDED TO NEAREST CENT
**PRICE FOR PRIORITY SHIPMENT AVAILABLE UPON REQUEST; FOREIGN POSTAGE EXTRA

1. PRICE LIST
The prices set forth herein may be changed without notice; however, any price change will be subject to the approval of the National Institute of Education Contracting Officer.

2. PAYMENT
The prices set forth herein do not include any sales, use, excise, or similar taxes which may apply to the sale of microfiche or hard copy to the Customer. The cost of such taxes, if any, shall be borne by the Customer.
Payment shall be made net thirty (30) days from date of invoice. Payment shall be without expense to CMIC.

3. REPRODUCTION
Materials supplied hereunder may only be reproduced for not-for-profit educational institutions and organizations; provided however, that express permission to reproduce a copyrighted document provided hereunder must be obtained in writing from the copyright holder noted on the title page of such copyrighted document.

4. CONTINGENCIES
CMIC shall not be liable to Customer or any other person for any failure or delay in the performance of any obligation if such failure of delay (a) is due to events beyond the control of CMIC including, but not limited to, fire, storm, flood, earthquake, explosion, accident, acts of the public enemy, strikes, lockouts, labor disputes, labor shortage, work stoppages, transportation embargoes or delays, failure or shortage of materials, supplies or machinery, acts of God, or acts or regulations or priorities of the federal, state, or local governments; (b) is due to failures of performance of subcontractors beyond CMIC's control and without negligence on the part of CMIC, or (c) is due to erroneous or incomplete information furnished by Customer.

5. LIABILITY
CMIC's liability, if any, arising hereunder shall not exceed restitution of charges.
In no event shall CMIC be liable for special, consequential, or liquidated damages arising from the provision of services hereunder.

6. WARRANTY
CMIC MAKES NO WARRANTY, EXPRESS OR IMPLIED, AS TO ANY MATTER WHATSOEVER, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

7. QUALITY
CMIC will replace products returned because of reproduction defects or incompleteness. The quality of the input document is not the responsibility of CMIC. Best available copy will be supplied.

8. CHANGES
No waiver, alteration, or modification of any of the provisions hereof shall be binding unless in writing and signed by an officer of CMIC.

9. DEFAULT AND WAIVER
a. If Customer fails with respect to this or any other agreement with CMIC to pay any invoice when due or to accept any shipment as ordered, CMIC may without prejudice to other remedies defer any further shipments until the default is corrected, or cancel this Purchase Order.
b. No course of conduct nor any delay of CMIC in exercising any right hereunder shall waive any rights of CMIC or modify this Agreement.

10. GOVERNING LAW
This Agreement shall be construed to be between merchants. Any question concerning its validity, construction, or performance shall be governed by the laws of the State of New York.

OTHER ERIC COLLECTIONS AVAILABLE FROM EDRS

STANDING ORDERS

Subscription orders of microfiche copies of all ERIC reports announced in each issue of **Resources in Education** average $130 per month at the rate of 8.2¢ per microfiche. Postage extra.

BACK COLLECTIONS (postage extra)

Reports in *Research in Education for* 1966 and 1967	$ 352.93
Reports in *Research in Education for* 1968	1092.73
Reports in *Research in Education for* 1969	1303.72
Reports in *Research in Education for* 1970	1327.42
Reports in *Research in Education for* 1971	1549.23
Reports in *Research in Education for* 1972	1603.51
Reports in *Research in Education for* 1973	1396.54
Reports in *Research in Education for* 1974	1459.60
Entire Collection	10095.68

SPECIAL COLLECTIONS (postage extra)

Office of Education Research Reports 1956-65	384.54
Pacesetters in Innovation, Fiscal Year 1966	137.46
Pacesetters in Innovation, Fiscal Year 1967	166.69
Pacesetters in Innovation, Fiscal Year 1968	106.60
Selected Documents on the Disadvantaged	317.84
Selected Documents in Higher Education	145.93
Manpower Research: Inventory for Fiscal Year 1966 and 1967	75.75
Manpower Research: Inventory for Fiscal Year 1968	42.22
Manpower Research: Inventory for Fiscal Year 1969	54.87

BRODART.

SPECIFICATIONS STEEL FILE CABINETS 63 Series

Microfiche

63-723

DESCRIPTION: Recessed, contemporay drawer pulls enhance the appearance of these grade A files. Cabinets are available with 4, 6, 8, or 10 drawers, 2 compartments per drawer with 26"clear filing space each. With or without locks.

Files are heavy-duty with fully welded frame. Heavy gauge cold-rolled furniture steel is used throughout entire cabinet. Welding of heavy metal channel uprights, cross pieces and sides eliminates the possibility of torsion even under severe strain.

Eight standard collors: Putty, Blond Tan, Desert Tan, Satin Black, Dove Gray, Mist Green, Olive Green, Slate Gray. Plea specify when ordering. Custom colors available on special quotation. Combination of microfiche and regular drawers in letter size cabinets available on request.

All units are 14 5/8"W x 28"D.

DESCRIPTION	HEIGHT	CAT. NO.	SHIPPING WEIG
4 drawer	29"	63-721	130 lb.
4 drawer w/lock		63-722	132 lb.
6 drawer	40 1/4"	63-723	187 lb.
6 drawer w/lock		63-724	189 lb.
8 drawer	52"	63-725	241 lb.
8 drawer		63-726	243 lb.
10 drawer	59 1/2"	63-727	288 lb.
10 drawer w/lock		63-728	290 lb.

559.50 each FOB N.Y. → (each holds 54,000 microfiche.

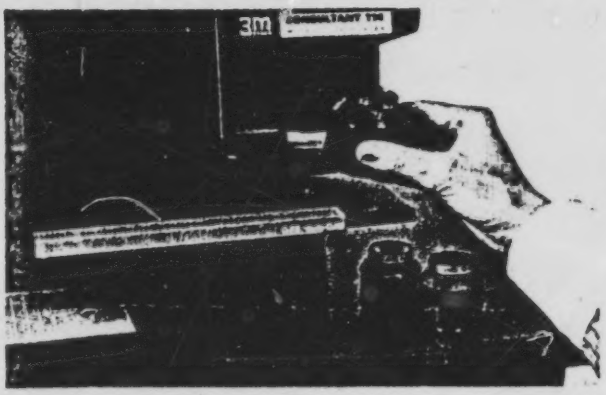
Figure 1

The 3M Consultant 114 Microfiche Reader

41

Figure 2

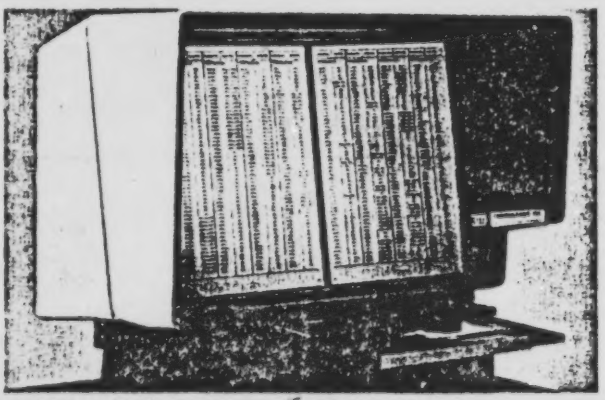
The 3M Consultant 114 Microfiche Reader



You'll find the Consultant 114 Microfiche Reader just as versatile as it is compact. You can use it for full-size viewing of COM, or double-page viewing of micropublications and jackets at ¾ size. It handles COSATI, DOD and NMA microfiche formats, with interchangeable index grids available for each format. Options include a single or dual lens assembly; and single or dual fiche carriers for either 4″ x 8″ or 5″ x 12″ fiche.

Best of all, convenient interchangeable drop-in lenses give you image magnifications ranging from 12X to 84X. In addition, the special vari-optic control lets you increase or decrease image size up to 25% without lens change. Both work simply and easily — no need for complicated optic adjustments.

Easy loading. Just pull out the fiche carrier and the glass flats open automatically for fiche insertion. Then push the carrier in and to the right — and the screen lights up automatically. The image scans in the same direction as the carrier, so images are easy to find. The operator can often select the image right off the screen, without reference to grid coordinates.



Full-size viewing. The Consultant 114 gives you 14″ x 11″ images, yet takes up less than 1 square foot of desk space. (Other readers this size can only give you a ¾ blowback.) The quartz halogen lamp and bright non-glare screen give sharp, crisp images — even from marginal film. These images can be viewed from any angle — even in a brightly lit room. Result: increased accuracy with less eye fatigue.

Specifications	
Film Mode:	Any thickness microfiche, micro jacket or aperture card up to 105mm x 203mm (4″ x 8″).
Carrier:	105mm x 203mm (4″ x 8″) or optional 127mm x 305mm (5″ x 12″).
Screen Size:	355mm wide x 279mm high (14″ wide x 11″ high).
Screen Type:	Blue acrylic.
Magnification:	12X - 84X.
Lamp:	150w/24v FDS Quartz halogen cycle (400 hours).
Power:	110/120 Volt - 50/60 Hz AC. 210/240 Volt - 50 Hz AC.
Dimension:	330mm wide x 228mm deep x 432mm high (13″ wide x 9″ deep x 17″ high).
Weight:	12 Kg (26 lbs.).

Microfilm Systems 3M COMPANY

78-1757-7278-5 (45.8) JR

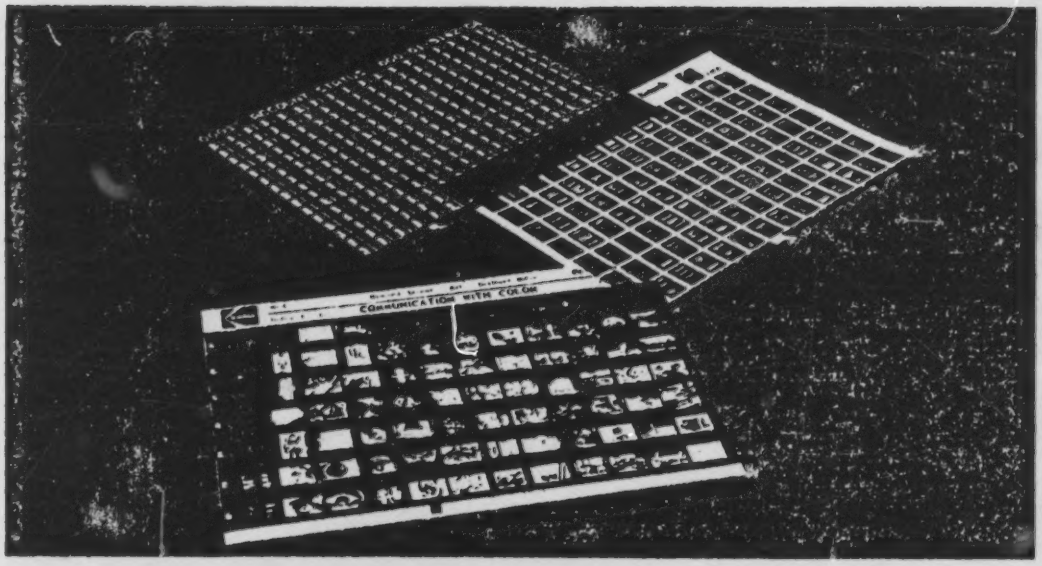
Litho in U.S.A. with 3M BRAND Photo Offset Plates, Film and Chemicals.

Figure 3

NEW KODAK EKTALITE 200 SERIES READERS HELP BRING THE WORLD OF MICROFILM INTO VIEW

MICROPUBLISHING AND KODAK EKTALITE 200 SERIES READERS

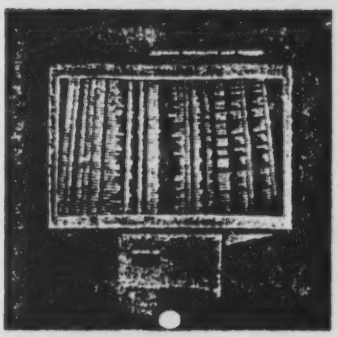
Figure 4



Many organizations have found that micropublishing is a fast, economical and efficient alternative to paper publishing. It is now being used for the publishing and distribution of industrial catalogs, parts lists, wiring diagrams, spec sheets and especially computer printout.

In fact, computer output microfilming has proven to be one of the most economical, convenient and speedy means of recording, storing, retrieving and distributing computer output.

Of course, all the benefits of micropublishing only come to life when the microfiche is read by the end user. This is where the microfiche reader enters as an integral part of micropublishing. This is where Kodak Ektalite 200 series readers come into view.



KODAK EKTALITE 200 Series Readers Features and Benefits

- You can display the total information area of a 14 x 11-inch computer page, or the full width of an 8½ x 11-inch document because of the large screen size of these dual-purpose readers.
- The Kodak Ektalite 200 series readers use a low-wattage, automotive-type lamp which uses less power than conventional lamps so that you'll save on power costs. The lamps are readily purchased in hardware stores or gas stations. Because the lamps have a longer life and use less power than a quartz-halogen lamp, you could save up to $50 per year, per reader, over the traditional microfilm reader.
- The small lamps also eliminate heat buildup so that Kodak Ektalite 200 series readers do not need a cooling fan and are noiseless. Service calls due to fan motor breakdown are eliminated.
- You have complete portability because the readers are 17¾" high by 14¼" deep by 11½" wide and weigh only ten pounds. They can go where and when you need them, even to field locations.
- The screen is made from Kodak's Ektalite material, a highly reflective substance which projects a crisp image that can be read as easily as a book, even in a well-lighted room.
- Diffusion is reduced and image contrast is enhanced because an internal filter rejects ambient light. Color images are exceptionally brilliant.
- Four Kodak Ektalite 200 series readers are offered. The 220, 224, 234, and 240. The numbers identify the degree of magnification available; 20×, 24×, 34×, and 39×. Each model also has easy-to-read dual-line indexing scales for X and Y indexing.
- Professionally staffed Kodak laboratories use high-speed equipment to answer your microfilm processing and duplication needs. Plus, Kodak can offer an in-depth analysis of your information systems to see if there are more cost-efficient methods to help manage your information flow. Kodak's broad range of microfilm products, services and expertise can work to your advantage.

Figure 5

MICROPUBLISHING AND KODAK EKTALITE 200 SERIES READERS APPLICATIONS

MANUFACTURING

Microfiche is now used to publish, distribute, store and retrieve catalogs, parts lists, computer printout, maintenance manuals, inventory reports, spec sheets, training programs and merchandising information. Color microfiche viewed on Ektalite 200 series readers can merchandise products and services to dealers and consumers. Plus, complex employee or dealer training programs are simplified by using color to highlight technical data.

BANKING

Kodak Ektalite 200 series readers can put bank personnel in touch with the computer. Account status reports, trial balances, transaction journals, exemption reports, name and address files and signature verifications can be put directly on microfiche for viewing on an Ektalite 200 series reader. The elimination of cumbersome printout sheets, through computer output microfilming, means customers can be accommodated quickly and easily.

BUSINESS

Micropublishing and Ektalite 200 series readers allow tight control over operations because data is easily accessible and manageable. Computer printout, customer files and source documents are easily stored, retrieved and distributed for prompt action.

GOVERNMENT

Microfiche provides a compact, easily retrieved and safe format that can be duplicated and distributed at low cost within local, state and federal government operations. Since Ektalite 200 series readers display full-page computer printout, they can be vital reference and retrieval aids for the numerous departments and agencies using vast amounts of computer data.

EDUCATION

Ektalite 200 series readers benefit both students and administrators. Color microfiche can help accelerate the learning process in self-teaching programs. Administrators can reduce paper handling while increasing the accessibility of everything from computer printout to individual student records.

MEDICINE

Students, doctors, technicians and hospital administrators have found color microfiche an excellent supplement to prints and slides. Color microfiche are crisp and clear, and cost less. Plus, color microfiche and Ektalite 200 series readers allow every medical student, technician and doctor to have his own portable library relating to his specialty. Hospital administrators can maintain neat, compact records on microfiche to be retrieved quickly and easily on a Kodak Ektalite 200 series reader.

Figure 6

KODAK EKTALITE 200 SERIES READERS SPECIFICATIONS

PHYSICAL CHARACTERISTICS:

Color	Universal gray and charcoal brown.
Height . . .	17¾ inches at maximum elevation.
Width	11½ inches.
Depth	14¾ inches at maximum elevation.
Weight . . .	10 pounds (approx.)
Shipping Weight . . .	12 pounds (approx.)
Carton Size	16½ inches x 13¾ inches x 19 inches.

POWER REQUIREMENTS:

Models are available at each magnification which operate on either 120-volt (±10%), 60 Hz power, or 120-volt (±6%), 50 Hz power, or 220-volt (±10%), 50/60 Hz power, or 240-volt (±6%), 50/60 Hz power.

MAGNIFICATION:

Nominal Magnification	
Ektalite 220 readers	20 ×
Ektalite 224 readers	24 ×
Ektalite 234 readers	34 ×
Ektalite 240 readers	39 ×

CONTROLS:

SWITCH:

Turns the reader on or off. In the "LO" setting, the screen brightness is reduced to approximately 60% of the brightness in the "HI" setting. Lamp life in the "LO" setting is increased by approximately 600 percent.

FOCUS LEVER:

Controls screen image sharpness.

CONTROL KNOB:

Moves the film from side to side for lateral image movement on the screen.

ELEVATION CONTROL:

Allows you to select eight different screen viewing angles.

FILM:

The readers accept microfiche or microfilm jackets up to 4.134 inches (105 mm) wide, at least 3 inches long, and 4 to 8 mils thick. Aperture cards also are accepted.

SCREEN:

Ektalite, curved, reflection-type screen, 11⅞ inches wide x 9¼ inches high.

PROJECTION LAMP:

Automotive-type lamp.

COOLING:

All necessary cooling is accomplished by natural convection.

INDEXING:

X and Y visual indexing is provided.

INSTALLATION:

By customer. The reader is ready to use once it has been removed from its carton and connected to a power supply.

EASTMAN KODAK COMPANY
Business Systems Markets Division
Rochester, N.Y. 14650
Kodak Canada Ltd./Business Systems Markets Division/Toronto, Ontario

For information on sales outside the United States and Canada, contact Eastman Kodak Company, International Photographic Division, Rochester, N.Y. 14650.

Chapter IV
Meeting ERTI Computing Requirements

The Stanford project team reviewed ERTI requirements for computing and information retrieval services in five areas:

1. Videotape and film production archive;
2. Computerized indexing and accessing of ERIC documents;
3. ERTI Library of books, reports, films, videotapes and educational materials;
4. Inventory control system for ERTI materials and equipment; and
5. ERTI general computing requirements.

A. MANUAL vs COMPUTER SYSTEMS

Because of the apparent urgent need for immediate services, the preceding recommendations are for a manual card-file system for the initial archive application and a manual plus microfiche ERIC system. Both of these sets of recommendations were designed to permit easy extension to a computerized system as soon as it became available.

Although a computer-based system would be helpful to ERTI, the need for immediate service makes it important that staff be recruited and trained immediately and service begun on a manual basis. Since a manual system can be installed much faster than a computer-based system, the recommendations for a manual system should be implemented immediately, even if a decision is taken concurrently to proceed with procurement of a computer-based system. The urgent problems are in staff recruitment and training rather than in hardware systems. The management plan and training recommendations are included in Chapter II.

B. SPECIAL-PURPOSE vs. GENERAL-PURPOSE COMPUTING

At the time when the computerized library and information retrieval systems at Stanford were implemented (SPIRES and BALLOTS), large general purppse computers were the only reasonable choice to provide the necessary computing power and storage capacity. All of the eleven major information

retrieval systems reviewed in Stanford's 1974 report to the National Science Foundation "A Feature Analysis of Interactive Retrieval Systems" were installed on large or medium-sized general purpose computers. Since that time a "revolution" in computer hardware and software has led to the emergence of special-purpose mini-computer systems that are tailored to specific applications and are much less expensive to install and operate.

Management problems are fewer on special-purpose mini-computer based systems than on large general facilities, because less interdepartmental or interagency coordination is required. Maintenance is simpler because the system cannot be disrupted by applications or services developed for other users. Dedicated rather than shared use leads to a more stable and reliable operational environment. System changes, if needed, can be scheduled at the convenience of ERTI rather than some other organization or department.

A later section describes the recommended system for ERTI.

C. COMPUTING vs HYBRID SYSTEMS

Information systems like SPIRES and BALLOTS at Stanford provide retrieval of information in machine readable form. This is suitable for retrieval of references to books, reports, films or videotapes. A separate (usually manual) process is required to retrieve the text of documents, film scripts, etc. unless those texts have been prepared in machine readable form and stored on the computer system.

The system in use at CBS and NBC utilizes a "hybrid" capability linking together computer searches with display of full text information stored in microform. For applications such as the ERTI film and videotape production archive, the computer indexing system would retrieve the shelf location for the video material and also display on a microform reader the text of the script. Since the script (or any other 'documents' associated with the video) are photographically stored, the information may include pictures and diagrams and be in any language.

This combined use of a computer system for retrieval of machine-readable information and microform retrieval of textual information, makes possible easier access to information than can be otherwise obtained.

D. THE CBS/NBC SYSTEM

In the August 1975 "Information Facilities" report to NIRT (Technical Report No.2, Volume IV), a variety of different manual and computerized U.S. archive systems were reviewed. At that time the system in use by CBS was recommended as the computer system most suited to the needs of ERTI. Also at that time the system was marketed by the Tymshare Corporation. Since that time additional systems in Japan and Europe were examined for applicability to ERTI needs. The CBS system has been expanded and improved. Tymshare sold their interest in the system to Zytron Data Systems of Sunnyvale, California, which now provides improved system support. The system is marketed through Kodak. A slightly different version of the CBS system has now been installed at NBC.

This CBS/NBC archive retrieval system was judged by the Stanford team to be superior to all of the other systems we examined in North America, Japan and Europe. Therefore, we recommend that whenever ERTI wishes to upgrade from a manual to a computerized system, that negotiations be undertaken with Kodak to procure the system for ERTI. The Iranian dealer for Eastman Kodak products is:

Haffo Co.
210212 Avenue Shah
Teheran, Iran.

At the Rochester head office of Kodak, the person in charge of marketing for the CBS/NBC system is Mr. Dennis Neary. Systems and marketing support is provided by Mr. James Morrow. The systems support group at Zytron Data Systems is headed by Mr. R.G. Gabbert. Their offices are at:

Zytron Data Systems
510 North Pastoria
Sunnyvale, Calfornia

References concerning the utility of the system can be provided by Mr. Sam Surrat at CBS, the address for which is:

CBS
52 West 52nd Street
New York, New York
(212) 765-4321

and from Mr. Robert Butterfield at NBC, the address for which is:

NBC
30 Rockefeller Center
New York, New York
(212) 664-4444 (extension 3797

E. THE MICRO 4000 (WITH MICROS SOFTWARE)

The computer system used by the CBS and NBC applications is a minicomputer system, the Micro 4000. It can support up to 16 remote terminals concurrently retrieving information. There can be up to 10 different data bases available at one time. The on-line disk storage capacity is 1.2 billion characters. (Plans are being implemented for further expansion of potential storage capacity). Tape drives are available for input from magnetic tape. Each of the terminals may have a computer controlled microfilm cassette reader attachment with a capacity of up to 2500 pages of information stored in microform with a 24 to 1 reduction ratio.

The computer software includes a flexible information retrieval system permitting records with variable numbers of variable length fields (analogous to SPIRES/BALLOTS capability). Inverted file indexing is available on any of the fields (e.g., subject, date, producer, location, etc.) to facilitate rapid retrieval.

The primary disadvantage of the system for ERTI at this time is that it would require use in English. Adequate software and display terminals for use in Farsi are not presently available.

Four appendices to this chapter provide detailed documentation of this system. Appendix 1 is a brochure describing the Micro 4000. Appendix 2 describes the concepts and capabilities of the Micros software. The Micros technical summary is in Appendix 3. Appendix 4 is the Micros users' manual in use at NBC.

F. APPLICATION TO ERTI

The Stanford project team recommends that ERTI, concurrently with implementing manual library and archive systems, investigate procurement of a Micro 4000 system. Actual implementation might be deferred until a suitable Farsi language display terminal has been developed and software converted to handle Farsi as well as English. If an English-language only version is desired, implementation could proceed more quickly.

Four data bases could be mounted on an ERTI Micro 4000 system. One data base would support the production archive system. The computer

system would permit retrieval of information about each film or video-tape in the archive, including where it is physically located. The microform facility would allow retrieval and display of scripts or other documents associated with the film. Terminals could be located in different locations. (In the NBC application terminals are located in two different states, New York and New Jersey.)

A second data base, if desired, could be the ERIC indexes. Magnetic tape editions of ERIC indexing could be procurred from the U.S. ERIC system and mounted on the Micro 4000. The indexing would point to which microfiche in the ERIC collection contained the documents retrieved. Manual use of the ERIC microfiche with a standard microfiche reader (as recommended in the preceding section on ERIC) would be the simplest and most economical way to proceed. If it is desired by ERTI, the ERIC fiche could be stored in a random access device attached to the Micro 4000 for automatic display. This feature is not recommended by Stanford for early implementation. The volume of use is likely to be too low to justify the cost.

A third data base could be the ERTI library catalog. Conversion of the library card catalog to this system, if desired, should be delayed until the two previous data bases are operating smoothly. The major installation cost would be the typing necessary to transfer catalog card information into machine readable form. For use within the library, the computer system would not provide significant capability not already available in the card catalog form. The main advantage of the computer system would be in the ability to have terminals for research and display at locations remote from the library. Present procedures in the library cataloging of film producing manual card files need not be changed since they have been designed for easy transfer to the computer system at a later time.

A fourth data base could be ERTI inventory information. Information could be stored concerning the location, quantity and status of ERTI equipment and instructional materials, both for the Teheran facility and Learning Resource Centers throughout Iran. The system vendor is prepared to install and support the computer software necessary for each of these applications, without requiring an ERTI programming staff.

G. ERTI GENERAL COMPUTING REQUIREMENTS

Three kinds of computing requirements of ERTI have been identified. One is for Fortran programming capability for the ERTI planning department. (Some Fortran programs useful as planning tools are being delivered by Stanford as part of this contract.) The second is for data analysis by the research and evaluation group of ERTI. The SPSS program package (Statistical Package for the Social Sciences) is the major requirement, although Fortran programming capability may also be useful on occasion. A possible third requirement is for a management information system, including inventory system capability.

Although diverse in nature, the aggregate of ERTI computing requirements is not sufficient to justify a general purpose ERTI computer facility. The ERTI general computing requirements can be met by the central NIRT computer facility, either on its own computer or on computing capacity from outside sources arranged by that facility. The specialized information retrieval computer system recommended for ERTI should handle the major ERTI requirements. The central NIRT computer facility provides the necessary Fortran capability and has committed to install SPSS capability (which should be operational by the time of this writing).

The major choice for ERTI with respect to a computer-based inventory control system will be whether to implement it on an ERTI Micro 4000 system or as an application on the NIRT central facility. This choice should be deferred until the video archive application is successfully installed at ERTI and until computer system decisions for the central NIRT computer facility are finalized. Much will depend on what hardware and software system are chosen for the NIRT central facility and on ERTI satisfaction with the Micro 4000. In the meantime, present manual procedures for inventory control should be maintained.

If ERTI is participating in the central NIRT computer facility decisions, some general comments concerning management information systems and their implications for computer system planning may be welcomed. Detailed software planning can not take place until the computer hardware is chosen. All major computer vendors have some software capability for the management information system applications. Nevertheless, availability of appropriate software should be one factor

taken into account in selecting a computer system. The greatest software capability is available for IBM 370 systems, although a large IBM system may be one of the most costly choices. IBM software runs well on Amdahl Computers (the founder of that company, Gene Amdahl, was formerly the chief architect of the IBM 360 systems). If there is a large enough capacity requirement to justify an Amdahl computer, then Amdahl machines, which have proven highly reliable in U.S. operation, are significantly more economical than IBM computers. Better hardware and software support in Iran may be available from IBM, however.

Large scale management information systems require a significant investment of talented personnel. Support and training costs will be significantly reduced if many installations in Iran have similar facilities. The National Iranian Oil Company (NIOC) is currently implementing a major computer-based management information system. NIRT may wish to stay in contact with the NIOC management information system manager, Mr. M. Mirbagheri (address: Computer Affairs & Information Services Group, P.O. Box 1863, Tehran, Iran -- telephone: 831629), to gain the benefit from their system planning, in case NIRT wishes to make similar decisions, or at least benefit from the NIOC experience.

H. STAFFING, TRAINING, IMPLEMENTATION

The production archive staff described in Chapter II will be a sufficient staff or utilization of the Micro 4000 system. The recommended training visit to CBS New York by the head archivist should be sufficient to permit him/her to achieve sufficient familiarity and confidence to train other staff in the use of the system. Any contracts with Kodak to install the system should include maintenance and documentation, including user documentation.

Chapter V

U.S. Video Libraries: Background Descriptions

A. OVERVIEW

The function of a television production archive is fundamentally different from other modes of storing and retrieving film and tape materials. The differences derive from the end uses of the materials stored. We have determined that there are three general modes of utilizing stored original film and tape materials: production-oriented television archives, conventional film studios, and scholarly archives. These modes will, for the purpose of this report, be referred to as types of archives, although in common usage they may carry descriptive names as "film libraries," "collections," and generally "vaults."

1. Production-Oriented Television Archives

With the coming of television a new kind of archive was necessary. The typical television production and transmission facility has a considerable amount of programming which is pre-recorded on film or tape or interspersed with electronic and film materials. In addition, many live transmissions are recorded for future use. From time to time, copies of program elements may be desired for secondary uses, such as picture, music and effects tracts for versioning into different languages. Obviously, this represents a storage problem of a complicated order. In addition, a broadcast facility typically maintains a news and public affairs division and an education division, concerned with accessing previously produced materials (i.e., programs, sequences, or individual shots). The circumtances of television production are inevitably beset with problems of time shortage and deadlines, and retrieval should be fast and certain.

Most television facilities will maintain files in the form of paper records of program scripts, news scripts, and research materials. It is essential to be able to access these materials with speed and accuracy.

Type of materials accessed in broadcast facilities are:

(1) Complete programs
  (a) Transmission copies
  (b) Elements
    1. Picture
    2. Composit track
    3. Narration track
    4. Dialog track(s)
    5. Music and effect track(s)

(2) Newsfilm
    (a) Sequences aired
    (b) Sequences not aired
    (c) Shorts not used in sequences
(3) Short-term storage
    (a) Material for versioning with variable return date
    (b) Material leased with firm return date
(4) Audio tape storage
    (a) Completed programs
    (b) Program elements
        1. Voice tapes
        2. Music tapes
        3. Sound effects tapes
(5) Written material storage
    (a) Broadcast scripts and transcripts
    (b) Program research materials
    (c) Administrative correspondence relative to individual programs or program series
    (d) Utilization materials
        1. Utilization guidelines: General and by Program or Series
        2. Utilization instructions: General and by Program or Series
        3. Evaluation Designs: Formative and Summative
        4. Evaluation Instruments: Formative and Summative
        5. Evaluation Results: Formative and Summative
    (e) Other written materials

After examining a number of situations which deal with the storage and retrieval of film and tape materials, it is our opinion that the needs of NIRT are best served by a computer-based search and retrieval system for film and tape materials and a computer-driven microfilm system for the storage and retrieval of written records. We believe that the best system of this sort currently in operation in the U.S. exists at CBS News in New York and that adaptation of such a system to the specific needs of NIRT can be accomplished in a reasonably economical manner.

2. Conventional Film Studios

Commerical producers of motion picture film are essentially concerned with the storage and retrieval of original film materials for purposes of duplication, i.e., the manufacture of release prints, and, to a lesser extent, the storage of original materials not utilized in previous production ("out-takes" and "overs") for potential use in future production. These materials are generally referred to as "stock footage". Most commercial film producers store the stock footage separately from the cut negative, fine-

grain or interpositive, and printing negative from which release prints are derived. The stock footage original materials are generally held intact, and when used in a production, a copy is made for inclusion in the new production.

Typically, the vaults of a motion picture studio have temperature and humidity controls to store their materials in climatic conditions which provide as close to the optimal conditions recommended by the manufacturers of the film as is economically possible. In most cases, however, no attempt is made to store materials with known degenerative qualities, such as color-negative, in more permanent formats (i.e., three-color separations on black and white film of archival quality). In addition, no studio, with the exception of those producing a great deal of film material for television, maintains vast holdings of original materials in their vaults. Materials thought to be of no potential economic value are either donated to national film archives, such as the Library of Congress, for use by scholars, or are destroyed. In previous times the silver potentially recoverable from black-and-white motion picture film was of sufficient economic incentive to cause the destruction of a great many films, which, in retrospect, would have had important artistic and cultural values.

In general, the major traffic of materials in and out of a studio vault will be to and from a laboratory. With relatively few destinations for the materials, problems of inventory control are limited, especially in those situations in which the studio maintains either its own laboratory or has a contractual or habitual relationship with only one laboratory.

3. Scholarly Archives

The third mode of storing and retrieving film and tape materials is the Film Archive, in the classic sense. This is, in fact, an entity concerned with the preservation of film and tape materials for posterity, according to one or another set of assumptions about the responsibilities of the organization. For example, the International Federation of Film Archives (FIAF) to which the vast majority of national film archives belong, takes the position that the primary duty of any national archive is to store the film production of that nation. The Imperial War Museum in London, on the other hand, takes the more limited view that its collections should be consistent with its institutional task, and essentially concentrates on films relating to military issues, typically involving the British Commonwealth.

Because the national or topical archive is concerned with preservation for posterity, its mode of operation is typically somewhat more restricted than that of a commercial producer. Decisions about preservation are made on the basis of cultural rather than economic criteria. Much of the effort of the archive may be directed to finding the best existing copy of a film or the copy closest to the original negative, or to transferring films from temporal storage media, such as nitrate-base film, to more permanent acetate-base film. Access to an archive is usually quite limited, and the original materials or best existing copies are seldom handled. Most often, "viewing copies" are made, together with a protection duplicate of the original materials. The viewing copies are utilized for screening and study by scholars, and the protection copies are used to generate additional viewing copies when they are needed.

The national archive will often go to considerable pains to reprint material which has been distorted or deformed by shrinkage. They will transfer color material from one strip of color film, which inevitably will suffer from dye deterioration because of age, to three-strip color separations, which do not degrade with age. A full description of the work of the national archive is to be found in Preserving the Moving Image by Ralph Sargent.

B. SITE VISIT REPORTS: INTRODUCTION

There is considerable variability among the three typical kinds of film and television archives visited. For this reason two of each type were visited. Table III-1 gives a summary of the attributes of the facilities, and detailed discussion follows.

C. CBS NEWS

Two CBS News facilities are examined here: a production-oriented television archive and a film retrieval inventory control operation.

1. Production-Oriented Television Archive

Source: Judith Hole

The CBS News Division is located at the CBS Broadcasting Center, some distance from corporate headquarters. The Broadcasting Center took over a large warehouse and factory, converting it to meet their requirements. The film library is on the third floor, the sound section and video storage in the basement. Other storage facilities for older film are located at Fort Lee in New Jersey. The corporate library and a special projects library for books and transcripts reside in the corporate headquarters.

When it was decided to reorganize the film and tape libraries, CBS called on the services of Sam Suratt, whose background included work for the University of California at Berkeley and the Smithsonian Institution. He also had considerable experience in computerized retrieval systems. His modernization made more efficient the process of keeping track of vast quantitites of footage which grow at a daily rate of 40,000 feet.

The flow of film into the library begins with initial entry into an inventory control program. When a film story is assigned, it is given an arbitrary and unique "assignment number", which is used as its log number for inventory purposes. The film assignment number together with several key descriptors is entered into the computer system. If a decision is made to use the film for broadcast, the "air-cut" of the film, that is, the material actually assembled and broadcast, is kept inviolate and cannot be subsequently re-edited. Material not broadcast is kept for a year, after which a

TABLE III-1

SUMMARY OF STORAGE ATTRIBUTES: SIX AMERICAN FACILITIES

		HOLDINGS				ACCESS			STORAGE		SHELVING		SPEED OF RETRIEVAL		SEARCH ACCESS POINTS	
NAME	FUNCTION	FILM	VTR	AUDIO	TEXT	MANUAL	COMPUTER	PLANNED EDP	TEMP.	HUMIDITY	HORIZONTAL	VERTICAL	FAST	SLOW	MANY	FEW
CBS NEWS	TV	X	X	X	X		X		70	50		X	X		X	
NBC	TV	X				X		X	70	?		X		X		X
UNIVERSAL	STUDIO	X			X	X		X	65	50	X			X		X
MGM	STUDIO	X			X	X			?	?	X	X		X		X
NATIONAL ARCHIVE	SCHOLARLY	X	X		X	X			70	50	X			X		X
LIBRARY OF CONGRESS	SCHOLARLY	X	X		X	X		X	70	50	X	X		X		X

decision is made as to which to keep and which to discard in order to avoid unnecessary duplication. Film is not kept unless it is of historical value or is thought to have potential uses in the stock-film library.

Shot lists and sequence lists of the air-cut and the unbroadcast materials are made, and each shot and/or sequence is entered into the computer with a unique identification number. Program producers are requested to generate copies of the materials rather than to re-cut them, but such action is not always possible under conditions of deadline pressure.

Film from the library is utilized in two modes:

1) In House: Out-takes from the original. When it becomes permanently filed it should be printed for use. Camera original is used for broadcast on occasion, but there is usually enough time to print a copy.

2) A straightforward stock film library: This is restricted to aired material with no CBS correspondents and contains no out-takes. The hard news film library and the documentary film library together account for 80 million feet of 16mm film. No full broadcast may be sold as stock, nor may the out-takes.

Some 35mm footage is still held, but is being transferred to safety film.

As of January 1974, 3/4 inch cassettes were made of all news broadcasts. Before video cassettes, an audio record was kept of all newscasts. Now the entire news broadcast schedule is kept on Sony cassettes. This requires the transfer of ten hours of Quad tape per week.

At CBS, the reporters and researchers keep their own notes, by tradition, except in cases where the story or program is of extraordinary importance. An attempt is made to get reporters and researchers to turn their notes and research materials to the central library where they can be coded, labeled with descriptors, and entered into the computer for search, as well as being transferred to microfilm for retrieval. This is a developing area within CBS and is still at a rather early stage of sophistication.

A recent policy decision at CBS called for the phasing out of film in favor of portable video-cassette location recording, using a portable color unit of high quality, such as the Ikegami and Sony color

video cassette records. Upon arrival for broadcast these tapes are transferred to 2-inch quad format with time-base correction, and are edited on a highly sophisticated computer-driven editing system, devised by CBS in conjunction with the Memorex Corporation, known as the "CMX System." The original recordings are kept in the videotape library, together with their "air-cuts" which, after editing and transmission on 2-inch quad tape, are permanently retained. The videotape library also retains the cassette recordings of news transmissions, which are made by technical personnel at the time of transmission. The library does maintain a playback machine, which can be operated by non-technical personnel.

From time to time outside broadcasts of news programs occur, such as the Watergate Hearings and the various manned satellite launchings, and these programs are videotaped and kept intact.

CBS stores some permanent material on video tape in Fort Lee, New Jersey, in temperature and humidity controlled vaults. Tape produced in 1959 has been played back satisfactorily. In the opinion of CBS the problems encountered with video tape result from the increasing sophistication in the technology of video tape recording and electronic cameras, rather than actual deterioration of the tape itself. To play a very old video tape, the current tape technology must be intentionally degraded to accommodate the technical standards which were utilized at the time of the original recording. This calls for considerable engineering time to set-up the tape machines and is costly in terms of the increased head-wear necessitated by the tape contact, play-back head tip contact, and tape tension required by older standards.

2. Film Retrieval Inventory Control Operations

Source: Neil Waldman, Director, Film & Video Library

Prior to 1954 CBS television used the services of Twentieth-Century-Fox Newsreel. Beginning 1954, they established their own newsfilm units.

New York and Washington are the major domestic bureaus of CBS news. Each of these bureaus assigns a unique assignment number to each film piece. The number carries a letter prefix which indicates its origin as either Washington or New York. In addition, the library provides service for the CBS-owned New York station (WCBS-TV), where local stories are distinguished by a letter prefix affixed to their unique number.

As film from New York or Washington arrives, it is logged on a traffic board, and details of location, reporter, camera team, and date are entered. The date, incidentally, is the date of entry into the library, rather than the date of production. Material from bureaus other than New York and Washington arrives without assignment number and receives such a number upon entry into the facility. If the film is not specifically earmarked for a particular program it goes to the library and is entered into the Film Retreival Inventory Control system (FRIC), which generates a computer inventory.

The FRIC system terminal operates by means of a series of prompts which inquire about essential information from the library employee handling the film as follows:

DATE

TITLE

REPORTER

SOURCE
(note: bureau location)

COMMENTS/RESTRICTIONS
(note: from accompanying documentation)

SUBJECTS

FOOTAGE

In practice, an individual may then make inquiry of the FRIC system to locate specific film items. The system will refer him to film can numbers, and the film cans are manually retrieved. A "dummy" can is then inserted into the film rack carrying the name of the person who has the film. The computer is also informed of this information, and will prompt "TO WHOM?". When film is returned to the Library it is measured to ascertain that the footage is accounted for, and the information about its return is entered into FRIC.

FRIC keeps a tight rein on the units. When the film is returned, the librarian measures the footage to verify that it remains the same as when it left the library. The sheet is marked accordingly. If not, up to three memos may be sent out to the unit and the person responsible. If it is still not returned, an addendum states "lost by unit X." Unit reports are typed out asking the producer where the film is and why it has not been returned. This does not, however, adequately prevent inhouse staff from exchanging film and leaving the transaction unrecorded.

The archivists work 21 out of 24 hours to keep abreast of the materials. The three hours remaining are to allow for cleaning. The library contains the open shelving area, the computer access units, filing rooms, shot listing rooms (with the appropriate technical equipment), and an SCM copying machine, for use with both paper and cards for files.

Film is processed in CBS labs in the same building, but prints for sale are done outside. Footage is shot on original color reversal. An archival quality master is made of films of great historic importance and then locked away. This is usually a fine grain reversal master, B-wind, with separate magnetic track.

Program transcripts are made in the special projects library from audio recordings. This is usually done overnight, after which the transcript is coded and indexed by date, using a variety of content discriptors. These transcripts serve as hard data for external queries regarding news coverage. CBS has developed its own descriptor glossaries. Every two months all accumulated broadcasting transcripts are photographed on microfilm in a cassette. By selecting the required transcript, through questioning the computer, the correct cassette may be inserted and the appropriate transcript reproduced in minutes.

The transcript section has a staff of four, each able to accomplish the indexing, editing, proofreading, and microfilming.

The CBS computer has a memory of 16K in core, and 220 Megabyte discs. All memory can be transferred to tape. Eight channels are currently available for entry and search. The computer contains all programing for FRIC and the microsearch system. The system was procurred from Tymshare Corporation.

The archive exists to serve the needs of the news service. It was stressed that archivists must be sensitive to news operations. It is up to the archivist to educate his colleagues to an awareness that it is by serving each others' needs best, that the service itself stands to gain.

There are about eight people working in the archival staff at CBS, including the following:

(1) Seventeen film librarians: All the librarians are highly versatile and well qualified. Abstract logic ability is a prerequisite in the use of the New York Times for determining descriptors. As a next step, CBS intends to hire specialists in disposition decisions (i.e., specialists in an area or a subject).
(2) Five videotape librarians.
(3) Five specialists in transcript retrieval: handling texts, microfilm, etc.
(4) Ten in special projects (i.e., clipping and assembling information on specific areas, including work for the corporation as whole).
(5) Twenty-three broadcast researchers.
(6) Four audio archivists.
(7) Two in the documentary film library: one librarian, one vaultman.
(8) One archivist.
(9) One deputy archivist.

Computerization at CBS began with the news and documentary film departments. The video section followed and finally the audio section. The computer is used by the audio department in special instances only, not as a routine procedure. For example, they will use it to locate input which is too recent to have been filed by their own department.

The audio tapes are the most comprehensive of any recording system. For instance, during the Soyuz/Apollo space link-up, there was one hour of filmed record, but the audio tapes were running all the time. Thus, there is a complete record for administrative purposes; also a producer may run through as many tapes as he wishes for background without incurring the heavy cost of employing a video tape technician, required to operate those machines under union contract.

The sound librarian distinguishes between what might be called "sound effects" and what he calls "actualities," that is, authentic sound recordings made on the spot. No "bank" of sound effects is kept,

although actuality sound may be sold to outside film-makers for use as sound effects. An example is political convention sound, which will be recorded "clean" to allow editing should the on-the-air commentator talk over one of the speakers. The sound archives are used by the Columbia Broadcasting Corporation to manufacture compilation records and cassettes for individual use or are combined with stills to make filmstrips of current events and the arts for high schools or libraries, as well as for use by outside film makers.

Two filing systems have been devised: (1) the "X" series, and (2) the Log Book.

a. The "X" Series

This collection consists of actuality cuts which have been aired on radio since 1952, usually of one minute in duration. The news and all radio broadcasts are gone through each day for any material of historic value and put on 1/4 inch tape on 10-inch reels. A log is made. In the X series, all entries are brief, perhaps as little as one line, and only contain the most salient sentences. While this process was originally carried out within the first twenty-four hours after broadcasting, it is now felt that by letting one or two months go by, a better historical perspective will be gained. Sample number: X7451-1 = X (series): 74 (the year): 51 (the 51st reel of the year) and 1 (the page number).

In practice, each one hour tape contains 2 to 2-1/2 days of actuality cuts from 30 to 45 different items. Each cut is transcribed in the log page as briefly as possible, using the actual words spoken. Each page of the log corresponds to a section of the tape reel designated by the insertion of leader in the tape. This makes for speedy location, as there may be four pages of log book to correspond with one tape, and three segments of leader allows for high speed location of the tape to correspond with the page.

The X series is typed up in multi-copy: one copy goes to the log book (one for each year), one copy goes into the box with the reel, and one goes in the vault book. Capitals are employed to denote the speaker.

If another well-known person is being spoken about, that name also is capitalized. Therefore, it is indexed under the speaker first, then the subject, then the general category: e.g., president address, etc. The indexer will annotate at the side of the page any other general category (e.g., "USSR"). There are usually three or four references per cut.

b. The Log Book

This deals with all that is excluded from the "X" series: the complete broadcasts, raw sounds, total coverage of events. This is not cross-referenced at all. Frequently mentioned categories are selected and filed under the appropriate two letter prefix: for show (FN = Face the Nation), for presidents (PN = President Nixon, PF = President Ford), for important addresses (AD).

On 5-inch by 7-inch cards, the date, broad category and general description is given, but not detailed. Similarly, the broadcast transcripts are given without details, are numbered, and are kept separately, as are copies of the New York Times Presidential statements.

This system uses unique numbers, for example: Sample Number: AD 75016, which is the date inverted (16/05/75 = 750516) and acquisition number all in one. Its use, however, implies a great knowledge of the material. It is timesaving in the sense that PN, AD, etc. are already established as categories. This second system is comprehensive and thorough, a necessary adjunct to the faster X series system. Its drawback is the minimal information held in the file.

The indexer sits in the newsroom with the file of current cards on hand. As the cards fill, they are transferred to the complete file, which is kept in the vault with the tapes.

The tapes are shelved alphabetically beginning with AD, etc. Standard metal shelving is used, since the archivist does not have to worry about magnetism. The archivist is planning to install moving shelves to save space. In the second vault, a system of shelving is used which involves more time assembly, but saves in using hardboard shelves instead of steel ones. This is the metal structural type seen in use in most offices.

The cans may be inserted vertically with no actual shelf in place, as they can set between the metal supports, resting on the structure's sides. According to Mr. Werber, the Audio Librarian, the tapes should stand to preserve them best. (Other archivists prefer that the cans be laid one on top of the other.)

Two files of transcripts are kept in the vault and the full collection of file cards.

A constant rather than a specific temperature is stressed for the vault. At CBS it is maintained at about 68 degrees. Humidity is also kept constant, though the exact rate was unknown. The durability of an archival tape from 1947 with a life expectancy of 20 years was checked at the Library of Congress. Made of acetate, it is apparently in good condition. Now polyester (trade name "Mylar") tape has a projected life expectancy of 100 years. Discs made in 1938 in the archive have excellent sound quality. They are fragile, however, and should be copied. Tape cassettes are used by the reporters themselves on the job. Cassette storage can be very expensive, but it has been found that standard 3-inch by 5-inch file cabinets do the same job more economically than specially made cabinets.

3. Summary

The CBS system is the best we have observed. Concern with production problems is combined with rigorous thought and purpose-built technology to serve the various needs of a busy and sophisticated broadcast operation.

D. PRODUCTION-ORIENTED TELEVISION ARCHIVE: NATIONAL BROADCASTING COMPANY

Source: John Haines
Supervisor, Video Library

The video tape library holds news program and commercial tapes for both local and network usage. The library is located within the RCA Building in Rockefeller Center with subsidiary long-term storage facilities at Fort Lee, New Jersey, a trip which can be made in two hours if the occasion demands. Because the building was not designed with film storage in mind, the allocation of shelving is determined by what weight the floor can support. Commercials and their records are held in one area, news and programming in another.

1. Commercials

Upon arrival, all commercials on film are transferred to two-inch quad tape cassettes. Two copies are made, and assigned code numbers. "C" before the call number designates commercial, and "F" designates that the original is on film. There is a computerized "ARIES" inventory retrieval system, which derives from billing and scheduling demands. Four letters and four numbers are assigned to each entry. This supplies positive identification, with little detail, viz: GFAB for General Foods, followed by four unique digits. The inventory lists the company, the production, length, shelf location, number, and disposal date, which correspond to instructions from the advertising agency. A ninety-day disposal period is assumed. Two weeks before the final disposal date the computer gives an automatic preparatory signal of four asterisks beside the item. The listing also includes whether the commercial is in black and white or color, and is able to supply information as to last date used, the number of times used, and whether it was broadcast on local or network channels. When the disposal date arrives, the cassette is erased and inspected.

Commercials are assembled one day ahead. A computerized schedule is issued from the Broadcasting Facilities ("Traffic") area detailing the required tapes in sequential order of bin storage. The initial assembly is on a time basis, showing only the first time required. When a tape is removed from its place on the shelf, an obvious dummy block is inserted with a label to identify it, and to indicate visually missing cassettes.

All pre-1968 reel-to-reel tapes are discarded. The technician in charge of degaussing keeps a random check on tape quality. At NBC Fuji and 3M tapes are used. They appear to be of similar quality, but using two sources allows NBC bidding flexibility.

2. News

At NBC some news is gathered on 3/4 inch cassettes. A unique number is assigned to each tape on the news floor and it is always referenced by this number. The tape is held until disposal instructions are received. The news department keeps a receiving log, and each item

is stored sequentially. Although the news for broadcast is transferred to 2-inch tape, all news to be stored is transferred at week's end to cassettes and the twenty-minute original cassettes are degaussed.

For program retrieval, when the title and topic are known, the location details must be obtained from the program analysis department. There is a strong need voiced at NBC for a computerized inventory system in this area, linked to the needs of other departments (i.e., business). This would be most advantageous in such areas as "space," "presidents," and "conventions." Of the 14,000 tapes (11,000 inventory and 3,000 local promotions) as many as possible are stored at NBC; the remaining are in New Jersey. As a separate card file is maintained for Fort Lee, it is necessary to check both the inhouse file and the Fort Lee file.

3. Cataloging

Filing is done by the standard readily identifiable numerical code. A materials arrival notice is filled twice a day, with four copies:

1 for traffic
1 for archive
1 for local standards records
1 for network standards records

Incoming tapes are categorized under show title:

1 copy = tape flow
1 copy = receipt
1 copy = for the cost accounting department file
1 copy = business office

The taped show record card is put on file, and transferred to the "erased" file when the tape is disposed of. There is an outgoing tape flow form for the return or erasure of tapes, with details of who authorized the erasure.

A librarian keeps records of each day's transmitted materials. A daily tape usage report is filled out by the video tape operators, to tell how many tapes of what length are in each category. On day 1, the show and tape serial number are listed, on day 2 it is annotated with the whereabouts of the tape: "hold", "outside", etc., then filed. There is a specific form for anyone who wishes to remove a tape from the library. This goes into the day's folder so that staff member can

see what needs to be put out. Although cumbersome, it serves well as a shipping or purchase record. It defines what people want to see, and keeps a tab on where everything is.

4. Personnel

Two non-union clerks: one for shipping, invoices, purchase requirements, typing;
One for commercials, checking routines, typing labels, program routines, contacting agencies;
Sixteen union library staff: one supervisor (union I-A classification - Group V), others (Group II).
One union person: checks tapes, does set-ups, repairs cassettes cleans, rewinds. He has some technical training.

A major problem in scheduling comes about from the fact that other departments want to borrow staff to cover as holiday relief. Generally, staff are agreeable because the archive is looked upon by many as an entrance point to more demanding television work. Requirements for personnel seem to include: being methodical, neat, having good memories, and some filing skill. A knowledge of the overall operation is helpful. There is a fairly high turnover, however, because the library operation is fairly hard, demanding work. It is also routine and unglamorous. There are eight job functions. Normally two weeks are given to become acquainted with the routine, and eight weeks to become proficient. It is necessary to keep the department functioning for twenty-four hours a day during the week, though staff is reduced over the weekend, particularly from early Saturday to early Sunday. The union contract allows for a shift differential of 22 per cent.

5. Summary

The NBC library is essentially designed to accommodate the needs of 30- and 60-second commercial scheduling within the structure of a profit-making television corporation. The conceptual basis of the library design seems to derive from conventional commercial broadcasting practices. Little attention has been given to the day-to-day demands of the program makers. Outside of the television commercial area, no efficient use of computers exists, and while the network has requested the library staff to devise means for the utilization of computer retrieval for program materials, little work has actually been done in this

area. One possible reason is that further computer retrieval design would necessitate a heavy investment in software in order to operate effectively within a partition of the existing ARIES system, which was originally designed to serve business and billing functions rather than to facilitate library operations.

E. CONVENTIONAL FILM STUDIO: UNIVERSAL STUDIOS

Universal City, California
Source: Allan Haines
Syndication Department

The administration offices of Universal Studios are in a long, low building with the dispatch and receiving room at the end, opening onto a yard where trucks may enter. Between the offices and the receiving room is the inspection room, equipped with splicers and viewers. An adjoining structure contains the stock footage storage area, consisting of small rooms opening off the street. The stock footage is kept in small metal pull-out drawers.

The film vaults are of reinforced concrete with sprinklers, necessitated by nitrate storage insurance regulations. The film stacks are of the "erector" type, fixed and mobile (tracked) units. At Universal, they rise to a height of 8 feet, but may go up to a height of 10 feet. The film reference number is put on white tape at the front of the shelf unit.

The adjoining laboratory of Technicolor uses modern, motorized shelving, on rails, moved by a light touch on the handle. They purchased the carriages and had the end panels made to their own specifications, saving 50 percent of the space compared to fixed shelf units.

1. Temperature and Humidity Factors

While it is admitted that in practice films in use are often left lying around in high temperatures and changeable humidity, a controlled environment is deemed important when considering permanent storage. The most common results of poor storage are shrinkage of film stock, change in color quality and cinching. For the latter, there seems to be no cure, but film stored on two-inch and three-inch cores seems to fare better.

Though nitrate-based film was discontinued in 1951-52, and no 16mm films were ever produced on this material, it is well to note that these films must be stored separately because the nitrate base gives off nitrous oxide which affects color stability, as well as decomposing over time. These films are stored in unsealed cans, in blockhouses with sprinkler systems.

Generally, the lower the temperature, the slower the deterioration of dye images in Eastmancolor, Fuji or Gevaert films. As they may change year-by-year, this has obvious effects when intercutting with an intermediate for titles, etc. Black and white is less critical. Acetate film, according to Universal, should be stored in sealed cans and taken out in advance of any use to allow for slow acclimatization to room conditions. The storage temperature recommended is 40°F to 50°F, preferably closer to the former.

Ideally, storage relative humidity should be between 35 and 40 percent.

Video tape has a higher tolerance for variable conditions. Significant temperature and humidity fluctuations should be avoided, however. Cinching can come about as a result of rewinding, resulting in horizontal lines on the screen.

Positive internal air pressure within the Technicolor building relative to outside air pressure reduces dust hazards.

2. Basis of Collection

Universal Studios use the vaults to store their own film and video productions. They also have extensive stills collections which come under the Publicity Department, a music library which stores the tapes from the sound department, 16mm magnetic tracks, 35mm "triple stripe" tracks which contain the dialog/music/effects tracks, and 16mm music/effects tracks for dubbing into foreign languages. Scripts are kept in "Central Files" in corrugated cardboard boxes. A master copy is kept permanently and more copies are Xeroxed when only one extra copy remains.

As well as the finished product, original films and copies for private screenings, fine grain pictures, original picture negative, sound track negative, positive track, positive print, etc. are kept.

3. Cataloging

Cataloging consists of a combination of computer print-outs and stock footage file cards. The Universal Studios' computer generates annual inventory, using a code number, title, year of release, and indicates whether the item is motion picture or TV product. There is a new book every year and new material is added throughout the year. The computer file, which is accumulated in batch mode and updated at intervals, is duplicated by a written log system enabling staff to have access to continually up-dated records. The log system consists of three books: television series, titles, and production numbers.

In short, program inventory access is provided only at three points: type of production (TV or theatrical), title, and production number.

Stock footage cards are kept in a separate facility which also deals with the administration of the footage. They are filed under how they can be used - "best shot building run by in a car", etc. The same shot may be filed under several categories. Three by five inch cards are used. They contain the can number, location, descriptive information (color negative/kind of scene/how it may be used) and a frame of the scene, inserted in the card. The edge number and original slate number are also kept on the card. The alphabetical files are ordered by categories.

A Traffic card keeps track of the usage: series, title, production, number, location, name, company, date out/returned. These are filed by series. When there are very many, alphabetical sub-categories are formed.

4. Retrieval

The Universal computer is at Kearney, New Jersey. When a film goes out, the card goes to the computer where it is entered. There is no on-line computer record available in Los Angeles. Veri-Visible systems in use in the record-keeping department serve the purpose of maintaining current records.

5. Staff

It was reported that in libraries of this sort, the jobs are dull and repetitive, and that the experience acquired has little application to anything else. Therefore, the employees should be dependable but not ambitious. Some considerable reading ability is necessary. The tasks may be divided as follows:

Record Keeping: when a film/video tape comes in, all information must be recorded (details as in the blue computer book previously mentioned). It may be labeled when it arrives, or its identification may be on the can or on an accompanying sheet. There's a need for correct terminology, standard language, and a knowledge of its application.

Keeping Track: records of callers, laboratories; ingoing and outgoing films.

Shelving: this may be functionally a part of the previous category or may be separate.

A suggested staff is: 2 record keepers, 1 supervisor, assistants, all of whom must have some literacy.

The staff work a five day week/eight hour day. The lab opens at midnight Sunday and works 24 hours until Friday night or Saturday morning. The studios may work 7 days/week 14/hour days. The vaults should, ideally, be linked to the lab. At Universal, it is not economically practical because of the cost of "dead" storage. Proximity to the laboratory generally means less chance of film going astray. The Universal vaults typically handle from 10 to 15 orders from the lab per day. Completed lab work may require two truck loads of 150 cans (10 to 12 shows). When returned, they are placed back on the shelves and the date is recorded on a card. One man spends his time discarding unwanted material. Packing film for shipment abroad presents unique problems: The film is weighed out of the cans, then weighed in cans, then weighed together, and finally, weighed again in the carton.

The staff comprises:

Supervisor - recording of film coming in
Shift boss - recording of film coming in
4 people - physical movement of film
2 people - in back vault
1 vault clerk - record keeping

6. Summary

Universal is a modern program and film production facility. It is busy in comparison with other simple facilities, but does not compare to the total traffic at a television network. Much work is duplicated because of irrational use of data processing equipment.

F. CONVENTIONAL FILM STUDIO: MGM STUDIOS
Culver City, California
Source: Roger Mayer
General Manager, Film Services Division

MGM maintains archives in a salt mine in Kansas for originals and prints, and storage facilities at Culver City for its working collection: the pre-completion stages of the film, and finished versions for viewing by visitors, stars, etc. Scripts are kept in traditional file boxes in Culver City. Still photos are kept in New York. This is an admittedly poor arrangement. Plans for a new facility were drawn up but no schedule of implementation exists currently.

As a result of MGM's experiences, Mr. Mayer strongly advised centralization of archival materials, including negative cutting, shipping and receiving in the same building. One advantage is the smaller number of personnel required. Stock footage of MGM is kept in small chambers off the central courtyard. Fitted wooden shelves have been built to contain shallow metal boxes placed side by side, one containing the positive print, the other the original negative material for each stock shot.

On a second floor there is a large area containing wire racks to a height of about 12 feet. Small cans, shelved vertically, are segregated from the containers holding 2,000 feet of film. A mobile ladder with adjustable safety legs enables staff to reach the higher shelves. In another large storage hall, filled with wooden shelving, feature film cans are stored horizontally, with all versions of the same film kept together in individual piles, corresponding to a list maintained in a master reference book. Because each pile is well spaced from the next, a single version is easily recognized and selected. This arrangement is not economical of space, however. Identification tabs on the shelves list what should be in each pile:

1557	Merry Widow	11R	Cyan Picture
(Prodn. No.)	(Title)	(length in reels)	Negative, etc. (Elements)

A feature of interest were large bins (two feet high by approximately fifteen inches) on the shelves, which contain trims, lifts, out-takes, and never-prints. They are loosely stored in small rolls: positive strips are identified by scene number, negative by edge numbers. It seemed unlikely that they could ever be accessed, at least in a systematic way.

1. Cataloging

Stock footage is cataloged in bound books, with frame insert and reference number.

Production books give detailed lists of shots that occur in any given production so that someone remembering a scene in a given film may track it quickly.

The background department maintains books of stills (black and white) taken from footage which can be back-projected - used little nowadays.

Films are cataloged so that each has a page/pages in an alphabetical series of bound books according to title. The catalog indicates only location. There is only one copy of this record.

2. Retrieval

The search is carried out in the bound books, kept for all types of footage in the same room. Vault number and shelf number are listed in the books. Titles are used for films, catagories by subject, location, etc. for stock footage.

3. Care

In a section of the same room which houses the reference books, an assistant checks the films and makes repairs where needed. Inspection of cans in storage seems informal, and no definite procedure was evident.

4. Staff

MGM recommends two persons to keep the records, with perhaps three assistants to handle the films.

5. Additional Information

A laboratory is on the MGM lot by tradition. This fact was stressed throughout, together with the idea that this arrangement would be entirely different if current management were starting from scratch. Eighty percent of the lab work is non-MGM originated.

6. Summary

MGM is essentially concerned with films in current release. They seem to have archival interests only in so far as material no longer in release may have some potential for future financial gain. The facility is antiquated and provided little information of use to NIRT.

G. SCHOLARLY ARCHIVE: NATIONAL ARCHIVES
Washington, D. C.
Source: William Murphy
Director, Film Division

The General Services Administration, through the National Archives and Records Service, is responsible for administering the permanently valuable noncurrent records of the Federal Government of the United States of America. These archival holdings, now amounting to more than one million cubic feet, date from the days of the first Continental Congress and consist of the basic records of the legislative, judicial, and executive branches of the government. While these research resources document significant events in the nation's history, most of them are preserved because of their continuing practical use in the ordinary processes of government, and the research use of scholars and students.

Among the holdings of the National Archives and Records Service (NARS) are extensive audiovisual archives consisting of motion picture film, still pictures, and sound recordings. Since its establishment in 1934, NARS has recognized the record character and historical value of audiovisual materials and has taken steps to ensure the preservation for future generations of stills, films, audio recordings, and video tapes from public and from private sources that relate to the history of the United States. Approximately 75 percent fall into the government category, 25 percent being private donations.

Today, the collection comprises 82,000 reels of motion pictures, including feature films, series of newsreels, unedited out-takes, training films and documentaries, dating from 1894; more than 5 million still pictures; and over 64,000 sound recordings dating from the turn of the century. Records are available for study but not for rent or loan, although copies may be purchased, subject to copyright or other restrictions.

1. Cataloging

When a collection is donated from a government agency, the Archive utilizes the agency's existing method of cataloging and indexing. This saves re-indexing time, but means that the collection remains a separate entity for storage, and requires the researcher to search several files. Shortage of staff, however, makes the use of this system more expedient than union cataloging. When a film arrives as a private gift, it is logged in and given an appraisal number. A letter to the donor certifies the deed and provides documentation as to the transfer of custody. The donation is appraised for historical value.

Every film is inspected manually upon entry. A record card is made out detailing physical condition and footage. It is entered in inventory control by a cataloger who makes a shot list and a summary for the file card. A source authenticity file is compiled of the releases, contracts, ownership rights with the same file number as the film, though filed separately. This card also specifies if a script is available. A production case file detailing transactions connected with the production is a necessary requirement for all government films. Inventory is on a computer format but at the series level only. The computer serves the entire National Archival collections, and is quite general. Therefore, "March of Time" will be specified, but each installment will not. It was suggested, however, that where there is a large collection with the probability of many questions, some sort of machine retrieval is worthwhile. A punched card system in use at the Imperial War Museum, London, was referred to in this connection.

There are two full-time catalogers who compile lists of titles only. A subject outline for catalogers is based on a Library of Congress list of separate headings, although there is a finer breakdown for World War I and II materials. Each film is numbered and this number serves also as shelf locator. The records are kept together by source with the original numbers as allocated by the original department, e.g., ATC = Air Training Command. With numerical as opposed to title control, the

card catalog corresponds to the numbers and is cross-indexed for the film subjects. There is a description of what the film shows -- major visual sequences rather than a thematic list. Physical characteristics (8 mm sound) rather than inventory items (MPSA, i.e. Matter Positive Acetate) are included. A shot list is absolutely necessary for unedited film. Five by eight inch cards are used, filed under the appropriate agency with alphabetical cross-reference. The National Archives recommends as good practice keeping subject information separate from inventory.

2. Physical Presentation

All films are either 35mm (white cards) or 16mm (blue cards). There is sufficient time to go through the footage for disposal of duplicates. Reductions to 16mm are made for color preservation copies, e.g. 35mm technicolor World War II footage. A 16mm safety film wetgate internegative may be made from a 35mm color nitrate print. 35mm safety film copies are made from 35mm black and white nitrate. After making a duplicate negative and a 35mm projection copy, the nitrate print is stored and kept as long as possible. The nitrate stock is held in Maryland, some 15 miles away from the Archives. The Archives serve as a repository for CBS newscasts. They are stored on 3/4-inch video cassettes. Black and white kinescope 16mm preservation copies are also held, as well as various formats of video records from government departments.

No systematic formal inspection is done of the stored film. Vertical storage is generally preferred. Raw stock cans are used for print storage. Antimagnetic precautions are deemed unnecessary for video. Shelves are of various types with hardboard or metal shelving segments. Storage temperature is held at around 70°F to 75°F and humidity at 40 to 60 percent. Ideally, the staff would prefer relative humidity of 50 percent. Sprinklers for fire are not used, and there are no air vents, but very sophisticated smoke detection devices were in place.

3. Staff

15 - lab personnel are separate, a part of the technical services division. Directly assigned staff are as follows:

1 supervisor

1 archivist -- reference area

3 archives technicians in the reference area. They have on-the-job training together with degrees in history and communications

4 film inspectors -- high school background plus inservice training

1 stacks person

2 catalogers -- film background.

4. Summary

The National Archives is similar to most scholarly archives. Fiscal constraints, lack of personnel, and a growing collection make certain shortcuts necessary, such as the maintenance of original catalogs of varying quality with each collection. The pace of work is slow, and users are generally satisfied with the compromises which trade speed and accuracy of search for size and scope of holdings. Highly skilled and experienced personnel are needed to aid users.

H. SCHOLARLY ARCHIVE: LIBRARY OF CONGRESS
Washington, D. C.
Source: Paul Spehr
Deputy Director, Film Division

Begun as a service to Congress and the film industry, the Film Collection is now used mainly by students and academics, 20 percent of whom are non U.S. citizens. The Library does not lend, but has good facilities for viewing films. There are 65,000 titles in the collection. The amount of material is extraordinary -- 135,000 cans of acetate film, 85 million feet of nitrate, of which five million feet are transferred to acetate per year.

Not all films produced in the U.S. are accepted by the Library, which has the legal right to compel deposit only of copyrighted material. Films which reflect social trends or convey a message about the U.S. society are selected for acquisition. Paul Spehr, Deputy Director, makes the decision

about documentary footage, by means of consultation and current reviews. The list of proposed acquisitions is then referred to Dr. John Kuiper, Head, Motion Picture Section, who makes the final selection; then it goes to the Reference Library.

Mr. Spehr is responsible only for the non-fiction material. A second officer makes the choice of fiction. All copyrighted American features are automatically taken. Not counting filmed television series, the choice is from among 800 to 900 films. If there is any doubt, the film is accepted. Uncopyrighted films are contributed largely on a voluntary basis, as there is no legislation requiring their contribution to the Library. However, should a company wish a film copyrighted, two copies must be sent to the Library. Mr. Spehr makes the point that this is a self-selecting process because of the cost of prints to the film makers. This tends to exclude the independent film-maker. The Library's dependence of the film-maker's initiative in copyrighting or depositing uncopyrighted films militates against a comprehensive collection.

1. Cataloging Procedure

On entry, a hand written card is generated with the shelf location, title and number of cans on a three by five-inch card.

The preliminary cataloger, typically a junior person, pulls the card, based on a previously chosen priority, and makes three initial determinations:

1) technical: scratches, etc. If a film is copyrighted, it may be sent back.

2) archival: the control aspect; from whom received, when, restrictions on viewing.

3) filmographic: subjects; date of release; director; cast; etc.

Two cards are made out, one for a public access file and the other for a limited access back-up file Yellow cards signify nitrate, white indicates safety film.

The term "archival quality" is not absolute. Three splices are the acceptable limit for a commercial film; more are acceptable for rarer items. If a master negative is received, a positive is made, and vice versa. Then the viewing copy is struck. Not all films have viewing copies, because of financial restrictions and lack of user demand.

The MARC computer system developed at the Library of Congress is used internationally and though not currently in use in the film division, could possibly be used there. However, the present computer implementation is not fast for access, and therefore might not be suitable for television application, and it is not appropriate for generating detailed print-outs. It is flexible in that one can pick out the fields needed, and can be run as an on-line system. (See Films, A MARC Format in the Annotated Bibliography in Appendix B.)

Steenback Film Viewing machines are used for viewing, and since there are no loans, there are no loan forms required. When a researcher wishes to view material, a request sheet is completed, an appointment made with a reference librarian, and an assistant gets the necessary material. Because a great deal of material is in the pre-print stage, it cannot be used for viewing. Therefore, not all materials are available to the researcher.

2. Staff

All staff are high school graduates and must have university training. Masters level librarians and history graduates are typical employees. A strong in-house training program is necessary for those with no previous experience. An ability to recognize people on screen is useful, especially for handling documentary and newsreel materials. An additional problem is the need to be aware when it is necessary to enlist the help of an expert, usually the senior cataloger. Cataloging for access and control is a most important aspect, and demands a sensitivity to user needs. The Library of Congress from time to time offers introductory experience of from one to three months basic training and recommends at least three additional months for practical experience before a staff member is considered to be fully trained.

Library of Congress Staff:

15 Librarians
7 Lab technicians
6 Nitrate workers
2 Reference librarians

This is not sufficient to keep abreast of the work to be done, particularly in the area of television tapes.

3. Building

The current building was completed in 1941. Its purpose was to house books, and their weight was to be supported by the central frame of the building. Its characteristics had to be accounted for in the design of the film section. The original shelves for books were arranged to accomodate the differing sizes of cans. The film index numbers state shelf location so, for example, the letters FAA designate the 400 foot reels, FBA the 800 foot reels, and FCA the 1200 foot reels. FBA continues on to FBB 1 through 9999 then FBC 1 through 9999, etc. Painted steel cans are used on hanging shelves. The floors are sheet metal over the building frame. There are no water sprinklers. A new building is currently under construction.

4. Inspection

One person checks the film before and after viewing. There are six inspection machines, three for 35mm and three for 16mm.

5. Summary

The Library of Congress Film Division is a typical research and reference collection. Access is primarily to scholars, and the collection itself is handled by very few highly trained specialists. It is similar to a closed stack book library. Use of computers is in a very early stage, and considerable doubt exists that the general library computer system is appropriate for the special needs of a film collection.

The Library of Congress belongs to FIAF (Federation International des Archives du Film) and has played an active role in the preservation of films as elements of the national cultural heritage.

Chapter VI
Italian and Japanese Systems

A. ITALIAN (RAI) SYSTEM

1. Introduction

Since 1968 the Italian broadcasting system (RAI, viale Mazini 14, 00100 Roma, Italy) has adopted a completley automatic archive and retrieval system for its audiovisual and printed material. The system as a whole is an adaptation of the so called Kwic Index, which had been already applied in other fields and in other countries, and has been specially modified to the needs of television and of the Italian language.

The system is based on a very analytic classification of the information, in which the most fundamental units stand out so that the information itself can be easily found also after some time, because the mental process of the researcher can not but follow that of the classifier.

2. The Structure of the System

"Kwic" stands for "key word in context" and a set of combinations of such words in alphabetical order is called a Kwic Index. This is the type of classification used for the material in the RAI Film Library; it facilitates the finding of suitable visual documentation and aids research.

The Kwic Index now replaces the system of classification by subjects, where separate cards are used to refer the researcher to the general card index. The key words are those chose to identify the content of each shot or piece of film; they usually consist of the characters or personalities, the subject, the event and sometimes the places which appear. They are therefore the basis for retrieving the material. Because of their logical grouping they briefly indicate the content of a piece of film; this indication is completed by a more detailed description printed beside it. Each shot or piece of film is identified by one line in the Kwic Index, such as this one: "Palio, Siena, Folklore, 1963, preparation trials parade and race in Piazza del Campo."

Each line in the Kwic Index also contains technical information about the type of film, its length, its size, the quality of the picture, whether or not it has a sound track, who owns it and legal limitations on its use, and lastly its allocation in the film library store-rooms.

Each event appears in the kwic Index once for each of its key words, since they are rotated and each one is placed in alphabetical order. For instance the line "Palio, Siena, Folklore' corresponds to two others: "Siena, Folklore, Palio," and "Folklore, Palio, Siena;" and so on for the rest.

In the Kwic Index, which is in the form of a large book, the researcher can find all the material preserved in the Film Library ordered according to subject, with a detailed indication of content wich enables him to identify a potentially useful piece with great ease.

In order to classify the films by the Kwic Index the following operations have to be carried out.

a. On reaching the Library the material is viewed by skilled personnel, who classify the piece, by individual shots or by groups of shots, using the key words, and make a note of the content, the technical data and allocation in the store-rooms.

In order to choose the same key words for the same types of events, or comparable key words for comparable events (a necessary condition for retrieving the information) the Film Library personnel have at their disposition the so-called "Thesaurus of the key words," which is stored on a magnetic tape and also printed as a book. This is particularly useful for words which have changed their meaning over the years (i.e., facism), for words which are used with more than one meaning, or for events which are defined by more than one word (i.e., Watergate, Watergate scandal, Watergate case, etc.). A special committee in Rome decides which is the right key word (the choice is very often a compromise), and all the information stored in a different way up to that momement is changed accordingly.

b. The above information is copied onto a form (like the one shown in Figure 1) and recorded on a tape. Every ten days the tapes are passed on to the RAI Computer Centre, where the data is processed and an alphabetical index containing all the decoded information written out in

FILM LIBRARY

TV-NEWS

MOVEMENT	RECTIFICATION		REFERENCE							POSITIVE	NEGATIVE	SOUND	FORMAT	OWNER	LIMITATIONS	SHOW CODE				
			B/W OR COLOR	DOCUMENT. TYPE	YEAR	DAY		PROGRESSIVE NUMBER	LEVEL OF DESCRIPTION							PRODUCER	SECT[illegible]	GENRE	PERFORMANCE	SERIAL NUMBER

KEY WORDS

CONTENT DESCRIPTION

A M G

1

2

3

Figure 1

79

87

89

full is printed. The computer selects and rotates all the key words so that the piece of film appears in the index under each of the subjects to which it can refer.

c. The information passes through a series of formal controls processed by the Computer Centre, which ascertains if the symbols used (i.e., for common names and Christian names) are right. The output of these controls goes back to the Film Library indicating the mistakes.

d. Every ten days the Computer Centre supplies the Film Library with an updated index in which the material acquired during the preceding ten days is merged with that acquired during the same semester.

e. Every six months this updated index is processed by the Computer Centre, which preserves all the information on magnetic tape serially so that it can be identified and modified at any moment. It is merged with the general index of all the material already in the Library to obtain a single index of the whole contents of the Film Library.

The above operations are shown in the following flow chart: "Diagram of the procedure of the Kwic Index" (Figure 2).

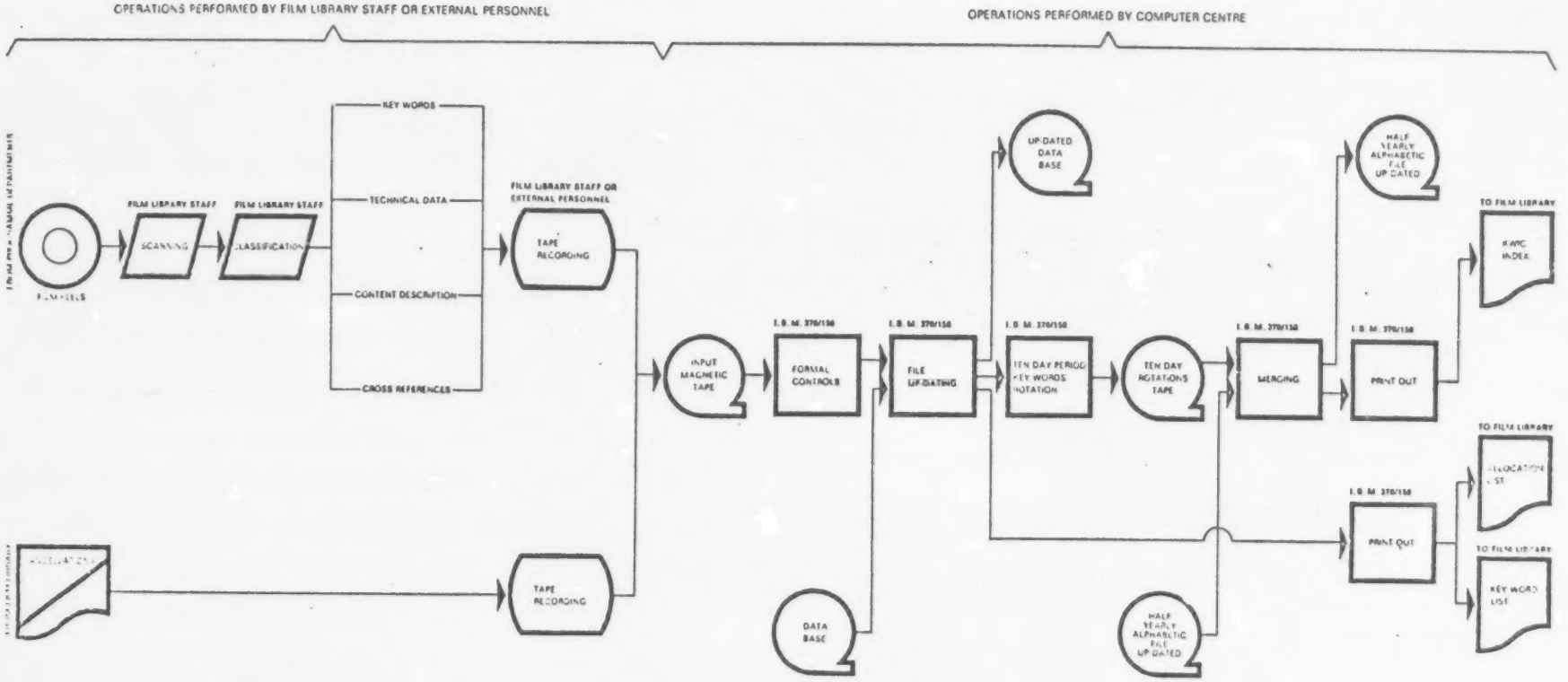
3. Characteristics and Advantages of the System

The system of automatic documentation has numerous advantages, as regard both organization and efficiency in research, if compared with the previous system of separate cards and a general card index. Instead of having to compile the subject cards, the classifier now makes out just one list of the contents of a piece of film (i.e., one line of the Kwic Index), and the various combinations of the keywords, which correspond to the various subject cards, are worked out by a computer. This has reduced the task of the classifiers, who can now examine the films more carefully. It also means that material is available sooner after reaching the Film Library. Work is also reduced because the classifier and the researcher use different documents: the former uses the forms, and the latter uses the Kwic Index book.

The researcher has the Kwic Index book at his disposal, and can work quickly and without any help from the Library personnel. The logical grouping of key words and the detailed description of content enable

Figure 2

Diagram of the procedure for processing the Kwic Index



him/her to spot the most suitable piece of film immediately; moreover all the material pertinent to any one subject is listed in one block, together with the details of each piece. For example, all the material on a certain event such as the Second World War is on consecutive lines of the Kwic Index (in a number of blocks) -- "War 1940-45 Aerial bombardment;" "War 1940-45 Western Front;" "War 1940-45 Russian Front;" "War 1940-45 Pacific;" "War 1940-45 Partisans;" and so on. Each broad topic has a number of sub-headings, which can suggest new uses.

The adoption of the Kwic Index has of course necessitated revision of the subject classification method. The key words must be chosen in the right way; they usually refer to the visual content of a film independently of the title, which used to be the basis for classification.

The processing of the Kwic data also supplies an alphabetical list of key words with their frequency of occurrence, and an allocation index, which lists and numbers the pieces under the various sections (i.e., news, documentaries, unused material, and so on).

An apparent disadvantage is that the system requires the manipulation of the information to be stored (key words, content description, etc.) and a long series of formal controls. (The alternative would be to memorize the information as it is, without any key word, and to constitute a "Thesaurus" for the words to be rejected, such as articles, adjectives, etc.). However, the rigid structure adopted, though requiring a large number of skilled personnel to scan, classify and control the information, is a guarantee of the quality of the stored information.

4. History and Evolution of the System

After an experimental application at the beginning of 1964, the new system was officially adopted by the Film Libraries of the Rome and Milan TV Production Centres, with very satisfactory results. It has been applied to all the material which can be partially used in the Libraries. For documentaries a more detailed list of the shots of the whole programme is also compiled; the researcher can refer to it if he needs a fuller description of the contents.

The general index, which lists the programes by titles, is still kept as a subsidiary to the Kwic Index, and is used mainly for repeats. But in order to avoid confusion or repetition, and for the sake of uniformity, all the films in the Library, from those made when TV was begun to those made in 1964, have been reviewed, checked, selected and indexed using the Kwic System. This delicate task was carried out by a group of specially trained documentalists, using a moviola to view the films.

In order to further rationalize the organization of the Film Library the store-rooms have been fitted with more convenient sotrage units which enable material to be retrieved more quickly. Formerly the films were contained in rather bulky metal boxes which were placed on open shelves. These have been replaced with steel cabinets having very small drawers specially designed to contain the pieces of 16mm film with magnetic sound tracks, the most commonly used for television. In this way the store-rooms can hold more materials.

The planners of RAI now think that the system need improving. First of all, the making and binding, every six months, of 80 to 90 volumes (which up to now list 600,000 pieces of information with two million different accesses: about three accesses for every piece of information) requires 15 to 20 days. The next step will be a series of micro-films or "micro-fiches",

As for the research time, this is already satisfactory: you can find a piece of information in the Kwic Index within 30 seconds. But some planners think that "Teleprocessing" (with a dialogue in real time between the researcher in the computer) will be a necessary new step.

B. JAPANESE (NHK) SYSTEM

The NHK facilities in Tokyo are unique in that much of the handling of videotape for broadcast is performed by a purpose-built automated system. NHK inventories consist of approximately 8,200 rolls of 2-inch videotape. The automated traffic system has a capacity of approximately 2,000 rolls, with the remainder of the tape kept in long storage or available for program production.

NHK automated video tape handling is facilitated by means of a specially coded plastic tape container code number, together with their

future broadcast time is entered into a mini-computer. The tapes are then inserted in a chute and onto a conveyor and placed in the automated store room ready to be retrieved as needed. An automated computer log of programs in storage and schedule is available on demand as well as at regular intervals for use by the Traffic Department.

On the day of broadcast the videotapes are automatically retrieved and appear at the videotape players for broadcast. Two tapes are used in order to ensure adequate stand-by service should a failure occur in the "on the air" player.

Subsequent to broadcast the tapes are re-inserted into the automated storage facility and they are either retained for scheduled replay, sent out of the automated system for long storage, or sent to a recycling station.

It should be noted that the automated storage system is purpose-built and operates in conjunction with 'ABCS" (Automatic Broadcast Control System) which provides automatic control for all major aspects of NHK transmission services.

1. Film Library

In contrast to the automated tape handling system, the NHK film library is relatively conventional and resembles many of the systems described in Volume IV of the Information Facilities report (1975). A Kardex system enables retrieval by an assigned call number, program title, and a class number which describes the basic content of the program. The call number is derived from the class number, year, month, day of production, and accession number, which suggests that these elements could be used for retrieval access as well. A copy of a sample page from the film library kardex is show in Figure 1.

2. Physical Storage

As in most film and tape libraries, humidity and temperature are closely controlled according to manufacturer's specifications. Film and tape are both stored vertically on racks.

3. Summary

The unique attribute of NHK's program library is its automated tape handling system. There is some reason to believe that such an elaborate

system is very much a technological show-piece, and that while its facilitation of traffic and program flow is undeniable, the capital and maintenance costs are probably more that most broadcast systems could comfortably bear.

Figure 1.

NHK: Film Library Kardex

COMPLETE FILM'S CUTS LIST

B . . ( ) Call Number*	番組名 Title of Program	副題 Subtitle	場所 Place
フィルム種別 カラーネガ カラーポジ リバーサルカラー モノクロネガ モノクロポジ シネテープ			ft

内容 Contents (基本分類: Basic Class No.	フィート数 Footage of each cut	分類番号 Class No.

→ Types of film

Color Negative, Color Positive, Reversal-color,

Monochrome Negative, Monochrome Positive, and Cinetape.

* Call Number = Class mark 1) + Year + Month + Day + Accession Number

1) Class Mark A = Newsreel

B = Program Film

C = Foreign Film (accepted from the Foreign News Agency and NHK Corespondents)

D = Subject Film

Chapter VII
Annotated Bibliography

The literature on film and tape storage and retrieval is not particularly rich, and tends toward the ideosyncratic. The two richest volumes are Helen Harrison, Film Library Techniques, which is the best source of general administrative and conceptual material for a working television and film library, and Ralph Sargent, Preserving the Moving Image, which presents a comprehensive survey of scholarly film archives together with recommendations for optimal storage conditions. Sargent tends to be rather idealistic in his recommendations and does not take costs into account, and his frame of reference is that of the long-term national historical archive. Harrison does not recognize the value and possibilities of computer search systems, although her book antedates many of the recent developments in the field.

What follows is a bibliography of the most useful and most contemporary books, articles, and reports available in English. Most of the memoranda and reports are available on request from the Stanford NIRT project office.

Abbott, John E., "Cataloging and Filing of Motion Picture Films", Library Journal, 63:3, February 1938, pp. 94-95.
Describes cataloging, administration and permanent preservation of an archive film collection at the Museum of Modern Art Film Library. Gives treatments and techniques for the preservation of old films. Good detail on how films from different countries are classified.

Aveney, Harriet W., Bibliography on the Cataloging of Motion Pictures, Working Memorandum, Library of Congress, 11 pages.
Gives a list of forty-two current references compiled by Mrs. Aveney who also worked on the FIAF committee on cataloging.

Battersby, Mark, Film Handling and Storage Building, Inter-office Communication, Internal Memorandum, MGM, November 17, 1970, 11 pages.
Copy of a memo written to Roger Mayer, General Manager of the Film Services Division of MGM when planning to modify their film handling and storage facilities. Interesting exposition on how a large commercial company assesses the need to streamline and improve its services. Provides realistic facts and figures about storage requirements (film load per square foot). Shows how labor and union requirements affect the decision-making process. A straight-forward business document with the theoretical leanings of the other references.

Blair, Patricia O., "Treatment, Storage, and Handling of Motion Picture Film", Library Journal, 71, March 1, 1946, pp. 333-336.
Superficial discussion on cataloging and care of footage; few facts.

Bradley, John G., "Film Vaults: Construction and Use", Journal of Society of Motion Picture Editors (JSMPE), 53:2, August 2, 1949, pp. 193-206.
Discusses the dangers and special needs in storing nitrate based films. Films of primary, secondary and tertiary value are distinguished as units of risk requiring separate storage facilities. Compares open rack versus storage in separate compartments in cabi-

nets. Secondary and primary values are found in the National Archives. A diagram demonstrates how water supply, baffle, and fire trap work together for protection. A retractor belt functions as a retractor device, and as an insulating device against heat. Insulated and uninsulated cabinets exist for primary risk of film. Describes the basic principle of the water sealed cabinet. Gives building instructions and dimensions. Emphasis placed on adequate air ventilation and air conditioning.

Bradley, John G., "A National Film Library - The Problem of Selection", JSMPE, 47, July 1, 1946, pp. 63-72.

Discusses the basis for selection and choices open to archivists. Argues for discretion in what is preserved, given the bulkiness of motion pictures as compared to books. The decision-making process has strong implications on the services of the collection. Volume depends on available funds. Shows filmstrip as a concise sequential assembly of still pictures from the original release. Suggests compiling a catalog from the selected print materials related to film which would be beneficial to producers and students. Outlines the various groups who might give suggestions for films to be preserved.

Bradley, John G., "Wartime Cataloging of Motion Picture Film", JSMPE, 42:3, March 1944, pp. 145-155.

Reference summaries, subject index cards, reference film strips are described in detail with examples of the first two. Time and labor are important factors which can be applied generally.

Bradley, John G., "L. C. Plans its Film Program", Library Journal, 71:22, November 1946, pp. 1592-1597, 1615.

A statement by the newly appointed director of the film library of the Library of Congress. Broadly outlines the library's scope and pledge to fill national and individual needs for motion pictures. General information on its services as a clearinghouse of film information.

Bradley, John G., "Specifications on Motion Picture Film for Permanent Records", JSMPE, 48:2, February 1947, pp. 169-170.
Considers the volume of film in relation to storage space -- an estimated 4,000 to 5,000 vaults of government material for the first few years. Coordinating recommendations of other agencies regarding size of vents in ratio to film storage load. Dispersal of archival storage for posterity is a consideration in a nuclear age. Temperatures of 50°F and humidity levels of 50% are maintained. Prices of cabinets vary: stainless steel approximately $30 per reel compared to the paintable Cascade cabinets at $2 per reel.

Card, James, "Film Archives," Image, 7:6, June 1969, pp. 137-141.
Recounts briefly the history of the film archives, beginning with the British Film Institute, Cinematheque Francaise to the founding of the International Federation of Film Archives. An apology for the film archive as opposed to a museum.

Chibnall, Bernard, "Shell Film Unit Stock Shot Library", Association of Special Libraries and Information Bureau Proceedings, (ASLIB Proceedings), 4:2, May 1952, pp. 59-68.
Outlines the negative to positive procedure of film making. Suggests the director of the film as most qualified to sort it, in collaboration with the librarian. Gives criteria for selection. Describes how positive is stored in rolls, negative in individual shots. Sound storage is separate, being possibly even more useful than pictures. Includes photos of an editola and a moviola and sample catalog slip (simple), used with an attached sample frame. Description and classification of the shot poses problems, the UDC system being inadequate for sound effects. Chibnall emphasizes importance of visual memory in a film librarian but not in place of good records. A librarian and two assistants look after two hundred and fifty thousand feet.

Chibnall, Bernard, "The British National Film Catalog and its Contribution to Information Work", ASLIB Proceedings, 11:5, April 1963, pp. 141-145.

Members of the Council of Europe were asked in 1961 to prepare catalog of their own nonfiction film production. Several organizations, among them Aslib, British Association of Advancement of Science, cooperated.

Collinson, R. L., "Libraries for Television", Library World, 67:781, July 1965, pp. 3-7.

Demonstrates the scope and variety of BBC services without going beyond mentioning the Dewey double system used for cataloging eighty-five percent of its television output. Extensive sound libraries complement the picture libraries. Research for programs may call for one picture from approximately one hundred thousand in the Pictorial Publicity Library. One and a half million feet of 16mm and 35mm is added monthly on a short-term basis to a current library. Film worthy of retention is transferred to the Permanent Library. Film qualifying for archival storage is made available for deposit at the National Film Archive. There is a Television Gramophone Library with 23,000 records, which contain microfilm catalogs of the main sound archives and commercial libraries. The Television Music Library stocks 35,000 scores, plus sheet music and has a studio service for orchestras. The Reference Library provides background research, books, maps, periodicals, and technical works for TV engineers.

Committee on Preservation of Film, Report of, JSMPE, 35, December 1935, pp. 584 - 606.

Specific information on tests carried out on two types of storage cabinets: the "cascade" and the "Puddle." Discusses fire and air ventilation and extent of fire spreading from one can to another. Gives equipment and room conditions for the handling and winding of film. Concludes with a discussion of printers for old and shrunken film. Good diagrams and photographs are useful, bibliography.

Crowther, G., "The Cataloguing and Classification of Cine Film at the Royal Aircraft Establishment", ASLIB Proceedings, 11:7, July 1959, pp. 179-187.

Discusses particular problems faced when much of the material is similar in type. Provides an example of a Cine Film Information Sheet, a section of a typical shot list with edge numbers and descriptions and a typical stock shot entry. Use made of the Universal Decimal Classification. Catalog cards use a system similar to that visualized by the Anglo-American Cataloging Code. Gives an example of a typical main entry.

Eastman Kodak, Storage and Care of Kodak Color Films

This pamphlet stresses the importance of correct storage conditions for color film. High temperatures and humidity affect the three color emulsion layer at different degrees. The processing of color film also affected. Here, errors become apparent only through passage of time. Recommendations of the Kodak company outlined.

Eastman Kodak, "Storage and Care of Eastman and Kodak Motion Picture Films", Kodak Data Book, in Basic Production Techniques for Motion Pictures, 18 pages.

Specific "how-to" information and very useful. Relative humidity determines the moisture content of films, not the absolute humidity. Discusses raw stock, processed color and black and white. Processed black and white should be stored at approximately 70°F with relative humidity between 75 and 90%. Outlines four suggestions for the storage of archival color film. Mentions cans, storage cabinets and their conditions, and deals finally with the care of processed films. Gives manufacturers of such equipment as is discussed.

Effinger, Carl M., "The Filing and Cataloging of Motion Picture Film", JSMPE, 46:2, February 1946, pp. 103-110.

The system in use in the Film Library of Twentieth Century Fox is detailed stage by stage from the making of synopses of usable scenes from major productions to single catagories for filing. Several staff members work together to balance opinions. Specific details of the significant categories are given with a sample page. Catalogs with duplicates stored in safes.

Fanning, David D., "The National Film Archive", Library Association Record, 64, 1962.

The British Film Institute collected through purchase or donation 19,000 films since 1933. Selection is by three committees meeting once a month. Staff: Curator, Deputy Curator; Chief Cataloger and two assistant catalogers (responsible for the book library, stills, and information research); Acquisitions Officers, and separately, Television Acquisitions Officer; the Films Preservations Officer responsible for technical side is in a distinct location outside London at the storage vaults; a Productions Librarian, a liaison with the industry. Describes an outline of the procedure for the accessions register, seven in all with copies to different departments. Uses "Kalamazoo" system (British equipment); classification by UDC; publishes a catalog of film in archive; member FIAF. Denmark, Norway, Spain and the Soviet countries copied cataloging rules and organization of the department for their archives.

Films; A MARC Format, The Library of Congress.

This is a magnetic tape format not particularly recommended for internal use within a retrieval system for video materials.

Galvin, Hoyt R., "Films in Public Libraries", Library Journal, 72:18, October 15, 1947, pp. 88.

Excerpts copied for possible sources on inspection equipment, building specifications for projecting; form by EFLA to evaluate a film for prospective audiences. Though equipment producers may be outdated, several firms still available. Suggests New York yellow pages as possible source for business companies. Pictorial presentation of film identification and storage procedures.

Harrison, Helen, Film Library Techniques, Principles of Administration, New York: Communication Arts Books, Hastings House Publishers, 1973. 277 pages.

Comprehensive study of the duties involved in film library work. Criticized for concentrating on news film; however, this may be its asset. Divided into fourteen categories: dealing with the function of film libraries, their history and development; selection principles and techniques; film handling and retrieval; shotlisting or sequence listing; documentation and storage of documents; cataloging; information retrieval; storage and preservation; staffing; layout and planning; economics; copyright; and future developments. Includes bibliography. Each broad chapter heading subdivided to provide more detail. Includes examples of shotlisting. Information presented in a thorough, orderly fashion; useful for those unfamiliar with archival work. Good reference for those involved. Only book of its kind to date and highly recommended.

Kula, Sam, Bibliography of Film Librarianship, The American Librarian Association, 1969, 68 pages.
Bibliography divided in sections to facilitate searching. Includes administration of film services, storage and preservation, training for film librarianship. Concludes with author, title and subject index. Over two hundred articles mainly from English library journals compiled, but without any editorial judgment as to quality. Articles range from highly superficial treatments and suggestions for enriching high school libraries to indepth studies for the Society of Motion Picture and Television Engineers. Most articles date from the thirties and forties; progress of film librarianship in recent years. Useful for background, less satisfactory for the working archivist.

Kula, Sam, "The Literature of Film Librarianship", ASLIB Proceedings, 14-15:4, pp. 1962-1963.
Gives valuable run down of the present state of research in film libraries. Mostly individual rather than formal research. Urges standardization in cataloging rules, to avoid such differences as

found between United Kingdom and United States and Unesco. Suggests a theoretical analysis of film cataloging. Gives further sources to investigate.

Kuprina, Yelena, Film City, USSR, Gosfilmofond, the Russian National Film Archive.

Biggest film depository in USSR, and serves also as a scientific and technical laboratory. Holds 36,000 features and shorts, adding about 500 each year. Film City contains production buildings, homes for the workers, a school, a foodstore, a library, auditoriums, and its own theater in Moscow. All films arrive in neg/intermediate pos/pos whereupon a deed is compiled which becomes the film's case history. Temperature is 10° to 12°C, and humidity is 65 percent. Inspection occurs every three years. Member FIAF. Brief description of indexing. Issues a bulletin and lectures given. Used by wide variety of public users.

National Archives and Records Service, Audiovisual Records in the National Archives of the United States Relating to World War II, Washington D.C. General Services Administration, 1974, 44 pages.

Reference information paper published as part of the National Archives records description program. Specific analysis of record group on a narrower subject area than found generally. Descriptions are arranged according to government organization. Holdings from other sources are separately listed. Attempts to indicate the scope of materials available for study and suggests areas for concentrated research.

National Archives and Records Service, Motion Pictures in the Audiovisual Archives Division of the National Archives, Washington D.C., General Services Administration, 1972, 34 pages.

Because the National Archives has the responsibility of preserving all permanent records of the U.S. government, many motion pictures were transferred to it from government agencies. NARS lists those records which comprise 75% of the entire collection. Remaining 25% represent

private donations and include newsreels from Paramount, World War II films produced by Warner Brothers, and a collection from the League of Nations.

National Broadcasting Company, Video Tape Shipping and Storage, New York.
An outline for the NBC tape facilities and their shipping procedures. Information on the number of bins and their capacity in relation to floor space. Gives a two-page floor plan plus four photographs Detail in plan unclear and photographs are hazy. Good reproductions may be obtained directly from NBC.

Sargent, Ralph N., Preserving the Moving Image, Washington, D.C., published jointly by the Corporation for Public Broadcasting and the National Endowment for the Arts, 1974, 152 pages.
Thorough account of the state of the art of film preservation for archives. Discusses the physical properties of film past and present and how best to care for both film and video. Analyzes current projects in developmental stages which may have significance for future archives. Included in the theoretical format are informal discussions with national archivists which demonstrate how practical solutions are reached. A final section deals with the special problems of videotape.

Seyer, B. J., "Filing Systems for Librarians", Library World, 65-65, 1962-63, pp. 63-64.
Overview of recent innovations in filing and storage of files. Explores advantage of lateral filing; illustrated. Rotary systems allow one operator to control up to 77,000 cards, but limits access by others. Wood has the advantage over metal for shelving for records by being a good insulator. See the ASLIB Yearbook. The Directory of Office Equipment (British).

Three M (Minnesota Mining and Manufacturing) Company, "The Handling and Storage of Video Recording Tape", Video Talk, 1:2, 1968, Six pages.

An output of the 3M Company's Magnetic Products Division. Introduction states, "If every one of the many suggestions were followed completely, an ideal situation would exist. Since many facilities can function adequately with less than the ideal, you may wish to adapt only a portion of our recommendations." Emphasis, however, on "The overall reliability of the system operation is directly proportional to the care that is excercised in . . . handling and storage." Deals with facts about the work area, storage, shipping, and training operator. Copies from: Product Communications, Magnetic Products Division, 3m Company, 3M Center, St. Paul, Minnesota, 55101.

UNESCO, "International Advisory Committee on Documentation, Libraries, and Archives", Fourth Session, Paris, September 18-21, 1973. Discusses problems of fragmentation in information services, overlapping on one hand and gaps on the other. UNESCO acts as promoter and co-ordinator of research for the International Federation for Documentation, International Federation of Library Associations, International Council on Archives. The UNDP finances projects in this field. Work in this area emphasizes the need for a national infrastructure. Suggests concerted effort necessary to train highly qualified manpower, including technical assistant in regional centers in developing countries. Basically a report on a meeting, little substance: a few addresses of possible use.

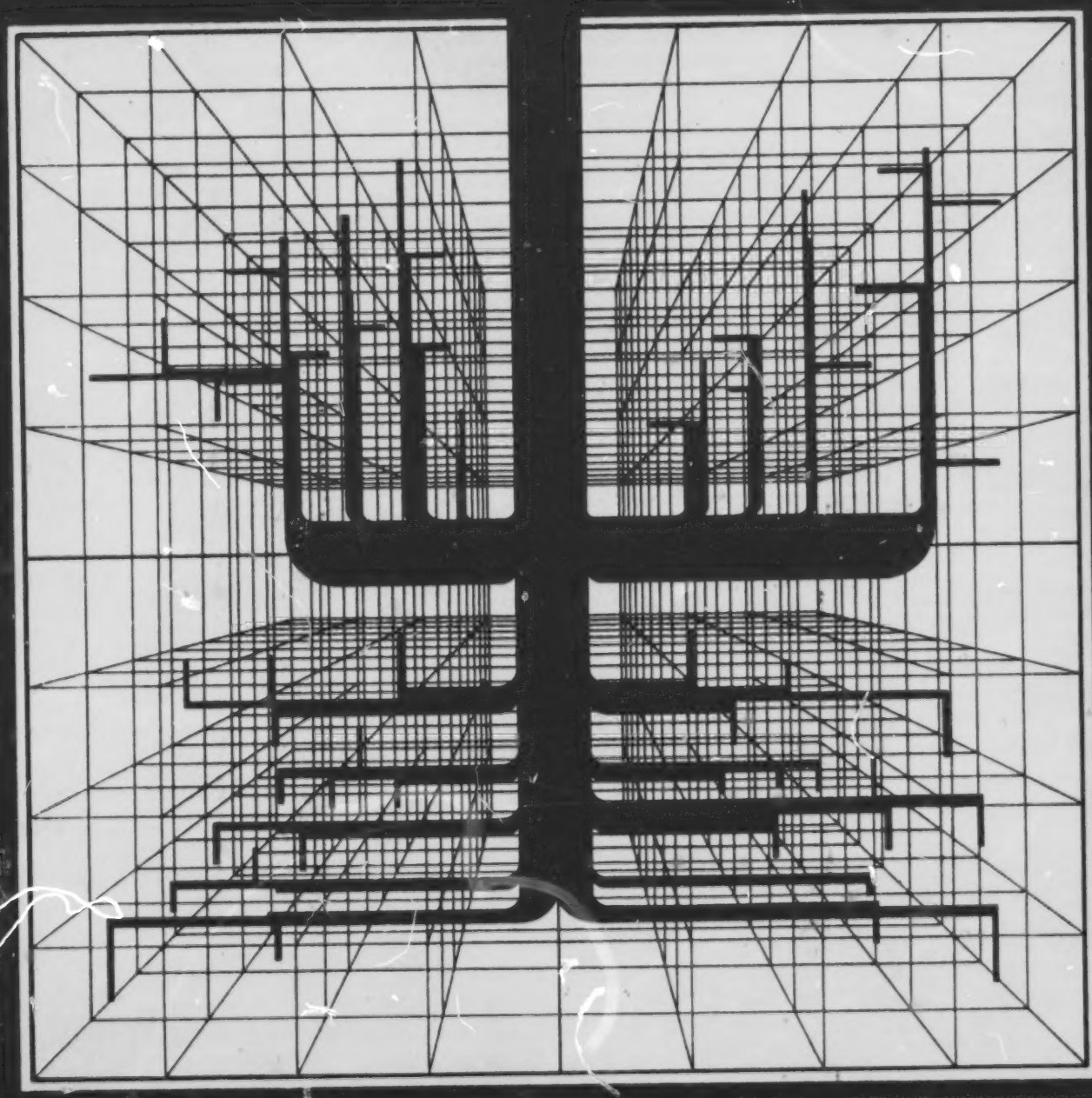
Volkmann, Herbert, "Film Preservation", London, English version published by the National Film Archive, a Division of the British Film Institute, 1965, Sixty pages.
Originally published in German in 1963 for FIAF; now translated into French, with Russian and Spanish versions in preparation. Deals with

fundamental principles of film preservation. After a discussion about nitrate film and its special problems, explains the composition of acetate stock of black and white, color and sound film. Some general conclusions about storage follow a discussion of magnetic film and tape. Climactic and economic conditions create storage problems necessitating temperature and ventilation controls, which, in turn, affect choice of location. Outlines way to meet those problems and discusses in detail several archival facilities. Consideration given to inspection, care and restoration of archival footage with a footnote on the qualifications of personnel engaged in archival work.

Appendix 1
The Micro 4000

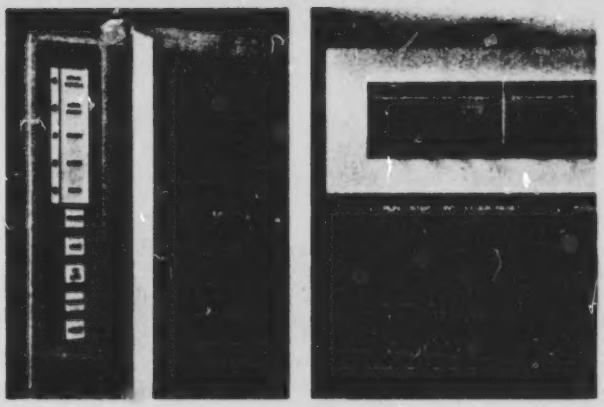
ZYTRON
DATA SYSTEMS

MICRO 4000



99109

MICRO 4000



Today's high demand for complete information immediately available to the user has placed unprecedented emphasis on new methods and technologies related to records management and file organization. In response to this challenge Zytron Data Systems has combined the power and flexibility of the computer with inherent advantages of microform media and presents the **MICRO 4000** System.

With the **MICRO 4000** System the following advantages of computer based data files are obtained:

- High speed data access
- Unlimited cross referencing
- Detailing, indexing and classifying
- Random retrieval by key words or selected index codes
- Tabulation and reports
- Statistical compilation

Add the advantages of microform retrieval capability . . .

- Fast, random filing
- Space savings
- Automated look-up and refile
- File integrity
- Hard copy capability

plus multiple work stations with access to the entire file, and you have the fourth generation concept of information control and retrieval.

How an integrated MICRO 4000 system can work for you

1. **Films** incoming documents in random order while keywords, index and data text information is entered into the computer.

2. **Stores** film document in convenient microimage format . . . a huge document file within easy reach of the user.

3. **Remembers** the exact storage location (film address) of each document according to all significant indices.

4. **Tells** you how many documents are on file that meet your search specification.

5. **Locates** each record in seconds and displays the data for review.

6. **Hard copy** of any document with copier attachments.

7. **Maintains** total file integrity—no misfiles, no lost file.

8. **Analyzes** information use.

9. **Secures** your file—special passwords limit access to authorized personnel.

10. **Reports** and statistics at high speed on optional line printers.

Get control over your information with MICRO 4000

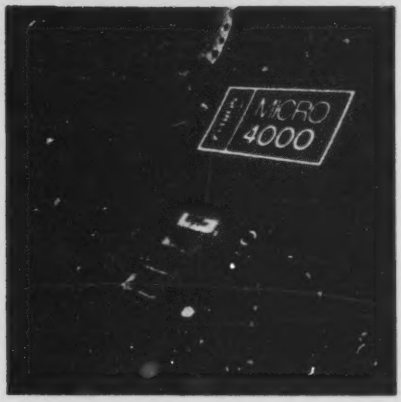
If you're not content with your present manual filing system, and you cannot economically justify using most data processing methods you've looked into, then you should investigate the capabilities of the **MICRO 4000.**

A filing task that may take hours or even days using your present system, takes only minutes or seconds with the **MICRO 4000** . . . and you have complete control.

Get more from your information with MICRO 4000

The **MICRO 4000** system combines the high-speed, selective-retrieval capability of a computer with low-cost efficient microimage information storage. The result is a system that allows you to realize the maximum usage potential from your information. You can easily index, search, add, delete and update your total information file.

Management Information Control and Records Organization



Who can use MICRO 4000

Typical applications

Law Enforcement
- —identification records
- —fingerprint files
- —field incident reports
- —mug shots
- —firearms registration

Banking applications
- —trust documents
- —cash statements
- —transaction journals

Libraries and archives
- —news clippings
- —broadcast transcripts
- —technical journals

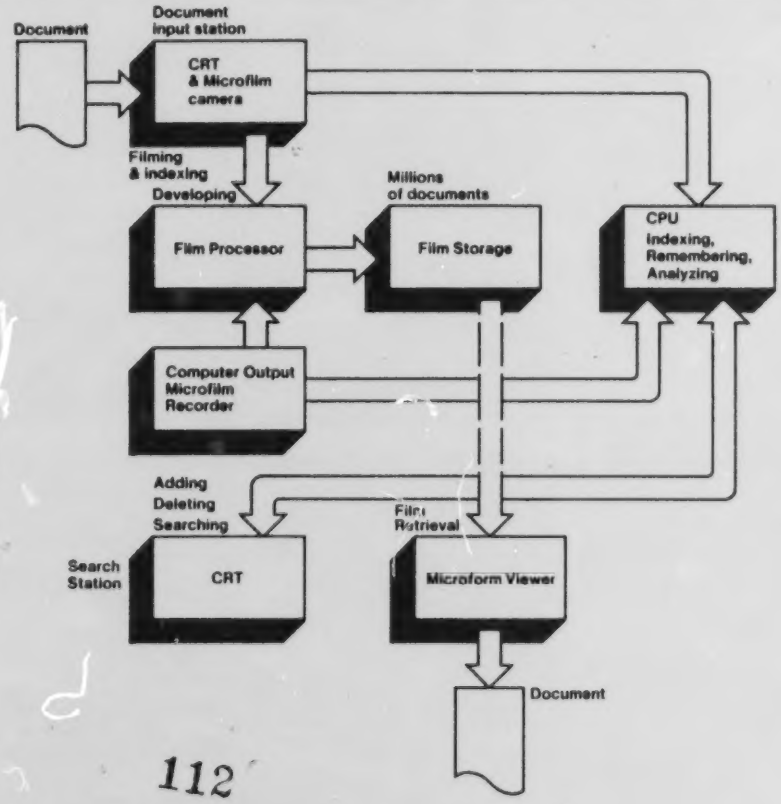
Business and commercial
- —personnel records
- —customer service
- —credit history files
- —invoices, purchase orders, order entry

Other
- —student records
- —title searches
- —medical history records
- —patent files
- —legal searches

Cost and Time Savings Comparison

Task	MICRO 4000	Manual Case Filing Systems
To set up new file.	1 minute	15 minutes
To add a document to a file.	1 minute	10 minutes
To purge a document from a file.	1 minute	10 minutes
To store the files—cartridges vs. filing cabinets.	12¢ a year per document	60¢ to $1.00 a year per document
To find a file when file key known.	5 seconds	1 minute
To find a file when only partial clues are available.	15 seconds	up to several hours, if at all

The MICRO 4000—an instant and direct path to the document you want



Management Information
Control and
Records Organization

MICRO 4000

Elements of the MICRO 4000 system	
Zytron Data Systems Central Processing Unit	1K to [illegible] expandable to 64K 9 track 800 BPI magnetic tape 8 terminal channels [illegible] Virtual memory and application software programs designed for use
Memory Disc Systems Available	[illegible]
Data Entry Search Terminal	CRT [illegible]
Microform Retrieval Stations	The MICRO 4000 system can be interfaced with a wide [illegible] Microfiche Systems. Both [illegible] and microfiche systems and retrieval stations are compatible within the [illegible] MICRO 4000
MICRO 4000 Features	
True Time Sharing System	[illegible] Virtual memory for [illegible] information. Firm-ware instruction sets for [illegible] data entry editing and correction. Remote maintenance and diagnosis. Terminal flexibility with [illegible] 9600 BAUD. High speed interfaces to [illegible] variable. Complete user accounting [illegible] Unattended operation. Linear and [illegible] data [illegible] searchable. Security [illegible] systems
User Oriented Languages Available	[illegible]
Formatted Data Entry	[illegible] operations. Data processing expertise not required for users. Provides error correction [illegible] deleting. Aborts applications
Search	Complex searches using multiple key word strings. Logical-and, or and not. Relational - less than, more than, equal to, and starts with. Hit save feature
Storage	Tape for transaction recording, system back-up. Interface [illegible] systems. Archive storage/retrieval. Disc for [illegible] passive data recording. Modular growth. Pack [illegible] for fast system saves. Dual disc systems for [illegible] and seeks
Display Data Base	[illegible] display on CRT for processing. Text subset of micro [illegible] Fast and easy updates

713
103

Appendix 2

Micros Concepts/Capabilities

ZYTRON DATA SYSTEMS

MICROS CONCEPTS/CAPABILITIES

I. GENERAL

The MICROS software package on the MICRO 4000 is an information management system which integrates microfilm, computer, and data communication technologies. Its design is based upon the need to:

a. maintain a body of information which is either too large to store on a computer economically, or is in a form unsuited for computer storage (graphics, fingerprints, drawings), or both; and

b. retrieve useful information on demand from that body under either time constraints infeasible for manual methods, or complexity requirements too demanding for mechanical methods, or both; and

c. provide full on-line service, including hard-copy capability, to a number of workstations, either local or remote.

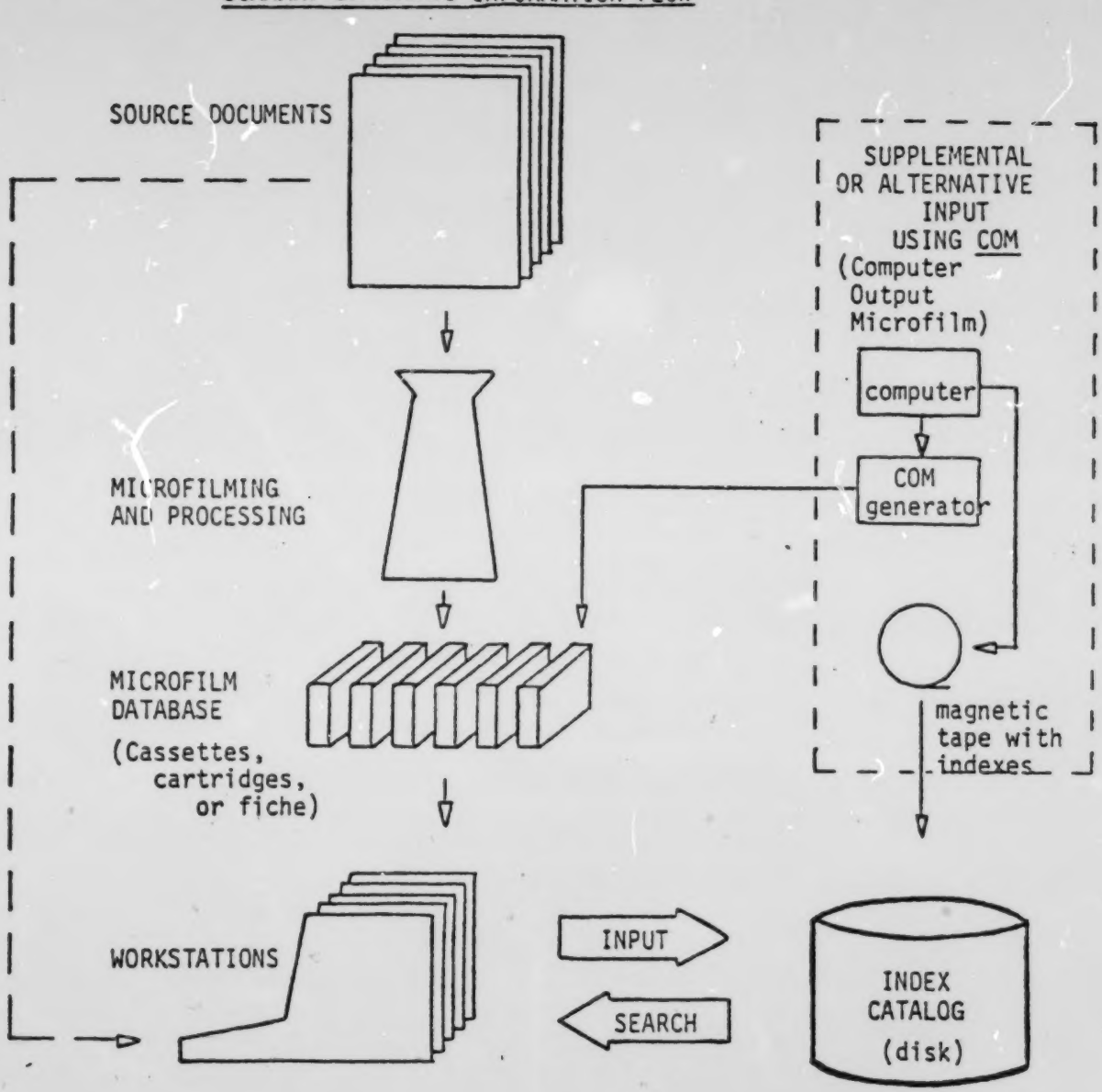
The MICROS user takes advantage of the economies, convenience, and security of microfilm by maintaining the principal database on microform media: roll film cassettes or cartridges, or microfiche. MICROS then maintains a cross-indexed catalog of selected locator terms, called "keywords", on MICRO 4000 disk storage.

* MICROS builds and updates the catalog with user-supplied associations between keywords and film-image identification numbers, provided by the workstations.

* MICROS researches the cross-index catalog at on-line computer speed and automatically displays the resultant film image or images at the requesting operator's workstation.

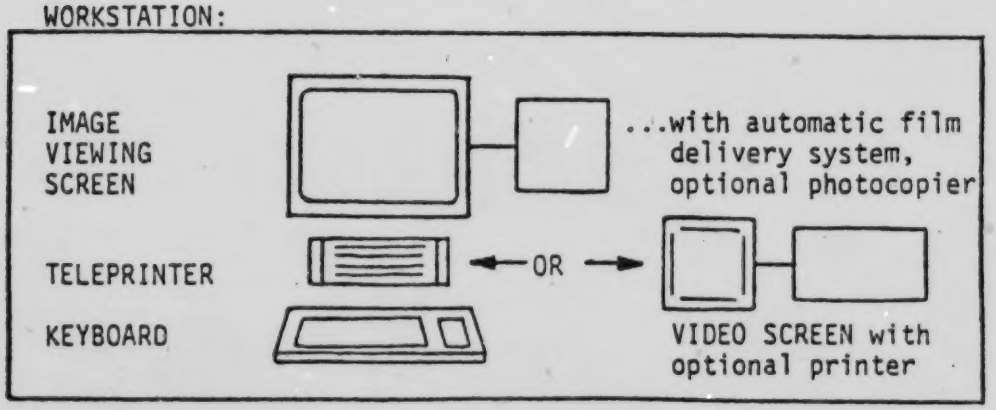
MICROS information-management power is extended by linking disk-stored text with digital displays, film images and catalog entries. Text linked with a film image will display automatically on a video screen or hard-copy printer at a workstation; anything from a short code word to a 32,000 character document can be used to update or supplement the information on film. Similarly, text messages can be used to annotate keywords for cross-indexed ("SEE ALSO...") retrieval.

SUMMARY OF MICROS INFORMATION FLOW



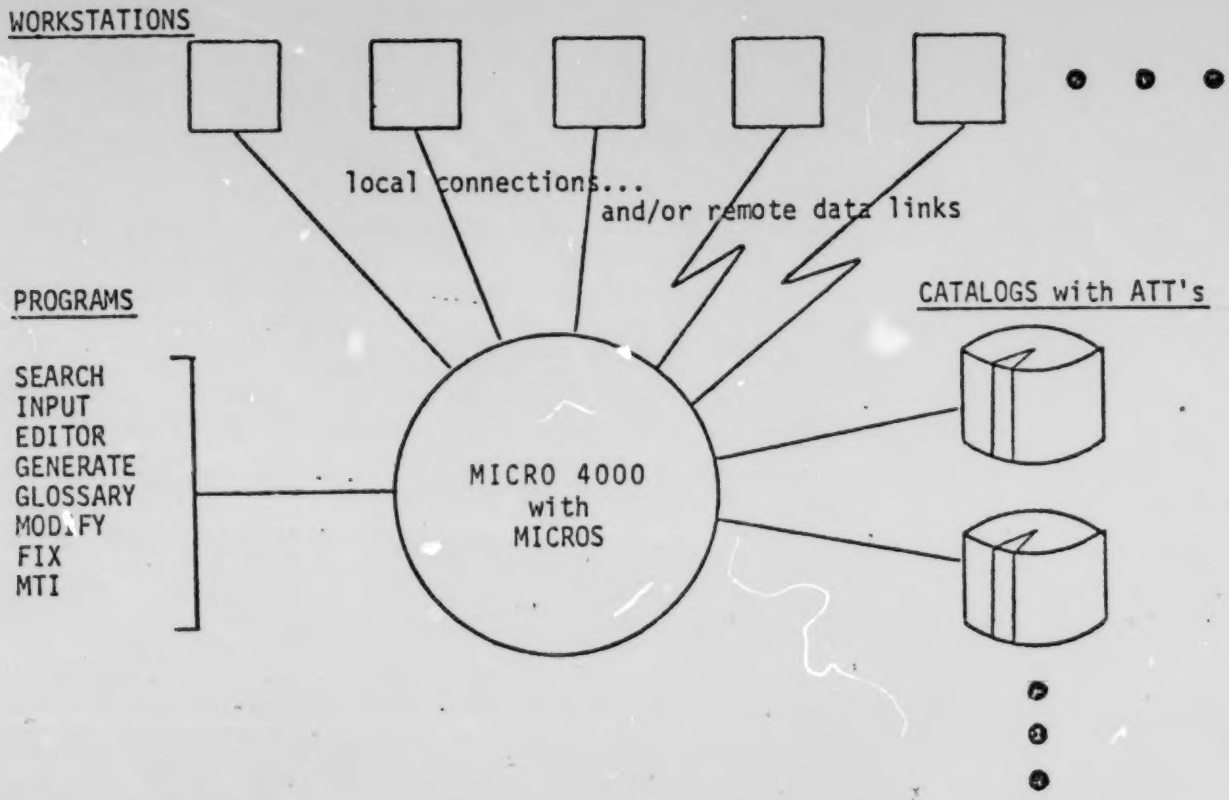
INPUT: operators enter keywords from filmed or paper documents
SEARCH: operators enter search criteria, film displays automatically

WORKSTATION:

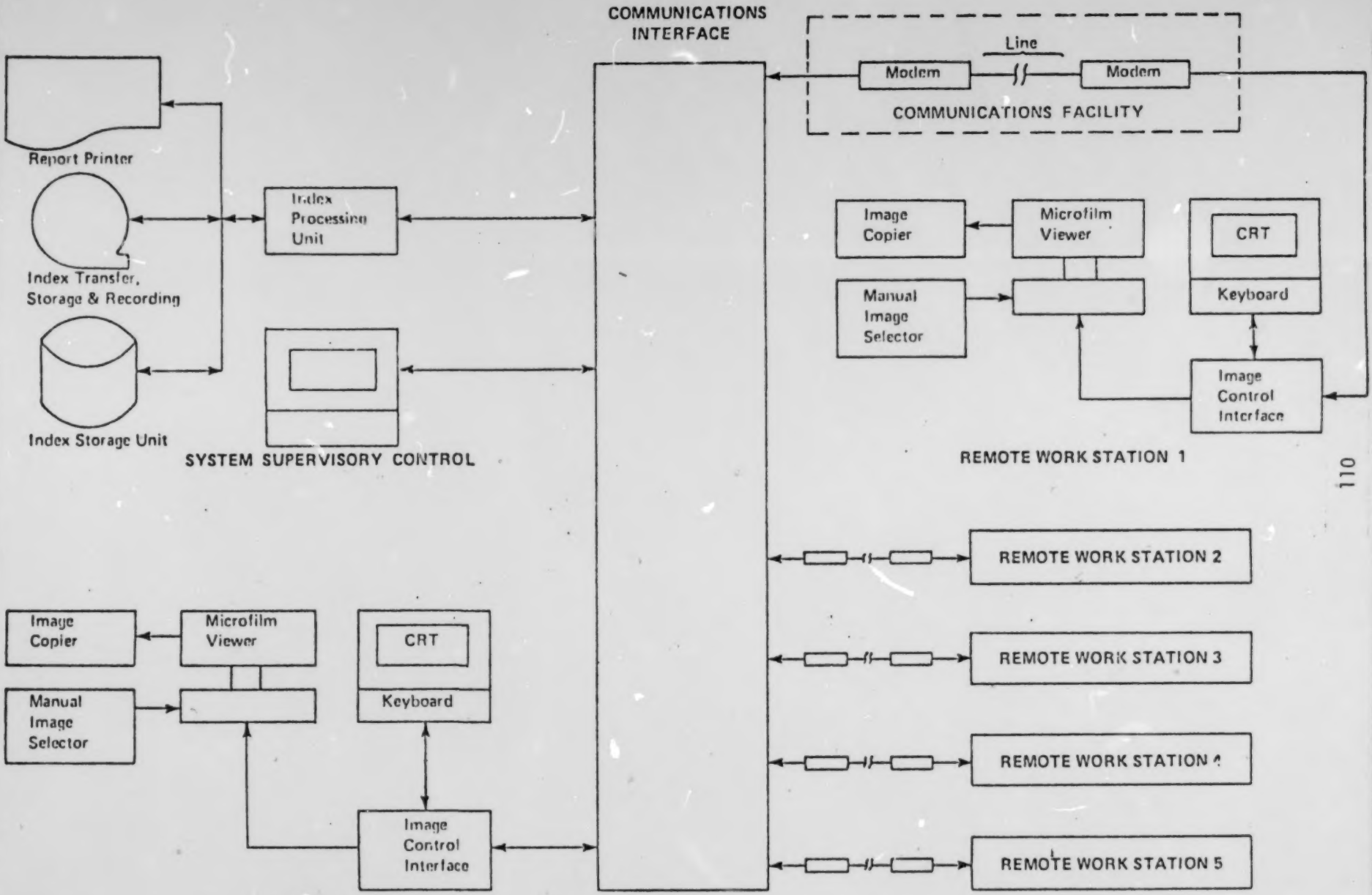


MICROS design recognizes the similarity of information-processing needs in many different user applications, and employs certain standard design choices for all: for example, disk storage techniques trade off batch-mode updating speed in favor of on-line retrieval speed. To accomodate a wide diversity of user applications, MICROS employs -- Application Tailoring Techniques -- which structures the MICRO 4000 System to fit the information processing and operator training requirements of each application; which allows the user to operate his system with the procedures and terminology that are familiar to him. MICROS applications include:

* corporate, agency, and institutional correspondence files
* personnel records and skills inventories
* research documents and engineering drawings
* broadcast journalism transcripts and archives
* police identification records
* hospital patient archives
* technical reference libraries
* property maps and architectural plans
* title searches
* court document management
* student records
* catalog sales order entry
* news clippings
* customer service
* credit history files
* medical history files
* patent files
* legal searches



- MULTIPLE WORKSTATIONS: up to 16, local and/or remote, on line simultaneously.
- MULTIPLE APPLICATIONS: up to 10, each with its own catalog , simultaneously available to any workstation or combination of workstations.
- MULTIPLE FUNCTIONS: any workstation or combination of workstations can simultaneously perform any function on any application.



110

119

ON-LINE MICROFILM RETRIEVAL SYSTEM
FIGURE 1

120

II. CATALOG ORGANIZATION

KEYWORD: an indexing word, phrase, code word, or number which is extracted from or applied to one or more microfilmed documents as a descriptor. Documents are then located by their keywords. Keywords can be up to 45 characters long.

LIST: a category for organizing and separating keywords. Lists are established for each application to provide naturalness and certainty in information management, as well as processing efficiency. For example, a personnel records application might include list categories of employee name, date of hire, salary, etc. Note, for example that list separation is necessary to distinguish the keyword "1950" as a year of birth from the keyword "1950" as a monthly salary.

CATALOG: an area within MICRO 4000 disk storage containing all the keywords, with their associated film identifier numbers, that index one user application.

* To save disk space, keywords themselves are stored only once, each followed by a table of associated film references.
* MICROS can access any keyword by direct-access lookup for immediate retrieval (1 to 3 seconds).
* Since all keyword entries in a catalog are organized in sorted (alphabetical) order within list category, MICROS can perform searches on such criteria as "names between Roberts and Smith", "part numbers beginning with XX1", "salaries above 15000", etc.

III. SEARCH

SEARCH is the information-retrieval program in MICROS. It operates on a simple two-step basis.

1. The operator types in a request (the "search string") which specifies the desired information. MICROS searches the catalog according to the criteria in the search string and creates a table of "hits", which are the identifying numbers of film images that fit the stated criteria.

2. The operator uses single keystrokes to automatically deliver the hit-images, one at a time, to the film-viewing screen of his workstation.

The search string can be as simple or complex as desired. The simplest search string -- a single keyword, such as SMITH,JOHN -- will result in a direct lookup, with the hit-table available in under three seconds.

When a hit-table is available, the operator can issue simple keyboard commands to:

* view the digital data display base;
* view the next hit (one keystroke);
* skip forward or backward in the hit-table by any number of hits;
* browse forward or backward any distance on the film without losing his place in the hit-table.

At any time, the operator can modify the result of the previous search by typing a "continuation" search string. When a search results in too many hits to view conveniently, further criteria can be added in this way to narrow the selection without reentering a complete new search string: this technique is often useful in "homing in" on documents whose exact descriptions may not be known. The intermediate results can be saved on the disk for future recall, if desired.

SINGLE KEYWORD SPECIFICATIONS

The simplest search strings involve only one list and one "keyword specification", which selects a possible single keyword or a possible set of adjacent keywords from a list. There are five "list relations" available, with two variants. The following examples also introduce the "default list", -selected as the one most frequently used in the application; an operator can locally override this selection whenever he decides to give more attention to another list.

o EXACT	list-name keyword specification
NAME = SMITH.JOHN	...selects and locates all documents indexed with the name "SMITH.JOHN".
=SMITH.JOHN	...is sufficient, if the default list is NAME.
SMITH.JOHN	...is sufficient, if the default list is NAME and the default list-relation is "=".
o RANGE	list-name / kws1, kws2
PARTNO/AB300,AB377	...selects and locates all documents indexed with any part-number between AB300 and AB377, inclusive.
/ AB300,AB377	...is sufficient, if the default list is PARTNO.
VENDOR/J,L	...selects and locates all documents indexed with any vendor-name in the alphabetical range of J to L; i.e., any vendor-name beginning with "J", any vendor-name beginning with "K", and (if present) the vendor-name "L".

o ABBREVIATION list-name : keyword specification

NAME: ROBERT ...selects and locates all documents indexed with the name ROBERT, or with any name beginning with those characters (ROBERTETTE, ROBERTS, ROBERTSON, etc.

:ROBERT ...is sufficient, if the default is NAME.

This feature can be especially useful when the operator is not sure of exact spelling.

o GREATER-THAN list-name keyword specification

o LESS-THAN list-name keyword specification

SALARY 12500

DATE 740101 (January 1, 1974)

These relations are not restricted to lists containing numeric keywords.

o UNIVERSAL CHARACTER (#)

The "universal character", "#", can be used in the keyword specification of an exact (=) or abbreviation (:) search to mean that any character in its prosition is accepted as a match.

NAME=ANDERS#N ...selects and locates all documents indexed with the names ANDERSEN or ANDERSON, but not (if it exists) the name ANDERSN.

DATE=####15 ...selects and locates all documents indexed with a date (in YYMMDD format) which is the 15th day of any month in any year.

LOGICAL COMBINATIONS

The real power of SEARCH is in retrieving information using logical combinations of search criteria. Any of the previous types of searches can be combined using the three "logical operators":

AND	...to match
OR	...to merge
NOT	...to exclude

While the words AND,OR, and NOT are chosen for naturalness, they are used with more precise meaning than is common in everyday speech. Their use in SEARCH is easily learned.

DEGREE=MBA AND LANGUAGE=FRENCH

...selects and locates only those documents indexed with both an MBA degree and French language skill. Documents indexed with one of the specified keywords, but not the other, will not be selected.

PARTNO:A#3 AND VENDOR/JA,LZ

...selects and locates only those documents indexed with both:

1. a part-number whose first character is "A", third character is "3", and whcih is at least three characters long;

and

2. a vendor-name in the alphabetical range JA through LZ.

ACETYLENE AND PROPANE

...selects and locates only those documents indexed with both these keywords in the default list.

OB=SECRETARY OR JOB=RECEPTIONIST

...selects and locates those documents indexed with either a "SECRETARY" job classification, or a "RECEPTIONIST" job classification, or both.

Note that this search would be proper for a user whose verbal request was "find all personnel records on secretaries and receptionists"; the use of the word "and" in this case really means "merged together with" (Logical OK) "whereas the logical AND means "both criteria on each target document".

ACETYLENE OR PROPANE

...selects and locates those documents indexed with either (or both) of these keywords, in the default list.

LANGUAGE=FRENCH NOT DEPT=INTERNATIONAL

...selects and locates those documents indexed with French language skill but not with the International department.

Note that (a) the NOT operator means AND-NOT in formal logic terms; and (b) while the other two operators are left-right symmetrical, the meaning of NOT definitely depends on left-right order.

ACETYLENE NOT PROPANE

...selects and locates those documents indexed with the keyword "ACETYLENE", excluding from these any which are also indexed with the keyword "PROPANE" (in the default list).

ADVANCED TECHNIQUES

Search criteria of any desired complexity can be specified using two features:

* First, any number of terms, separated by logical operators included: the search string is evaluated from left to right.

  JOB=SECRETARY OR JOB=RECEPTIONIST AND LANGUAGE=FRENCH

  (The left-to-right rule means that this example refers to French-speaking employees who are either secretaries or receptionists, not to secretaries plus French-speaking receptionists.)

* Second, parentheses can be used to combine items into a single group that can be acted upon by a logical operator.

  (DEGREE=##EE OR DEGREE=LLD OR DEGREE=MD) AND
  (SALARY> 25000 OR DHIRED <690101)

  ...refers to electrical engineers, lawyers, or doctors (or multi-educated people within these areas) who have a salary greater than $25,000 or who have been hired prior to 1969 (or both).

IV. DATA ENTRY AND MANIPULATION

Information is stored into MICROS catalogs by a three-step process:

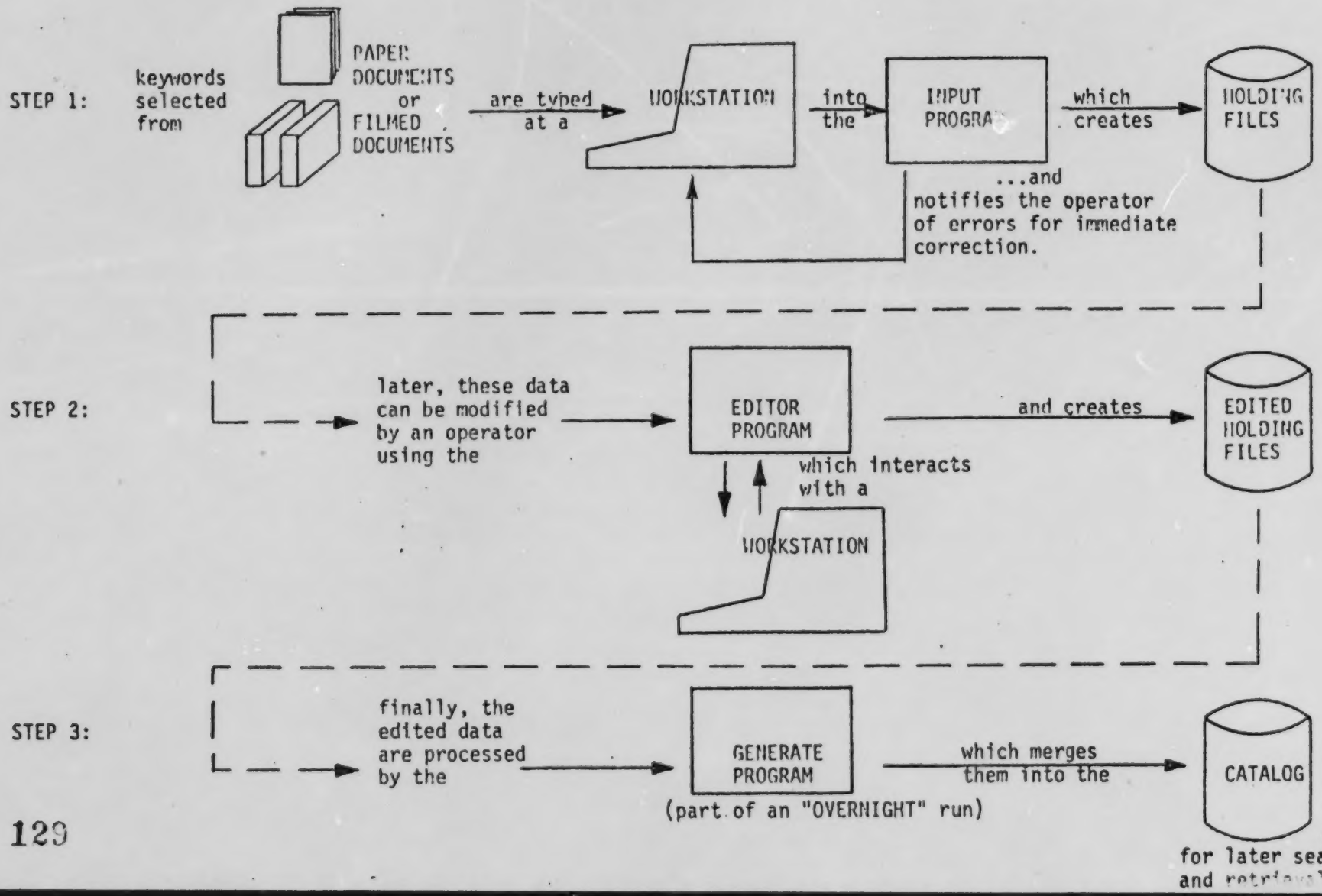
1. Initial data entry into holding files, with simultaneous data validation. Data can be entered either by reading a magnetic tape from another computer, using the Magnetic Tape Input (MTI) program, or by on-line source data entry and validation at the workstations, using the INPUT program.

2. On-line editing of the holding files. The final holding files are merged into the catalog by the GENERATE program. Although catalogs are protected against simultaneous access errors (i.e., SEARCH can run concurrently), GENERATE is typically run as part of a larger program called OVERNIGHT, which runs unattended and included MICRO 4000 system backup and other "housekeeping" steps.

Since many MICROS applications assign the bulk of operator time to data entry, Zytron Data Sytems heavily tailors the INPUT program to guide and assist operators in indexing, using procedures which fit the application. Data entry can be done (a) before filming (with paper documents numbered to correspond to image numbers in the forthcoming microfilm cassette or cartridge), or (b) during filming (using an integrated data entry/filming workstation), or (c) after filming. In either case, keywords may have been marked on the source documents before filming, or may be selected by a trained operator while scanning the image (or paper document).

The INPUT program asks the operator to supply a "target" number to identify each document for later retrieval; if indexing is from film, the operator positions the viewer at the desired image and then strikes one key to identify the target. MICROS then handles all necessary film movement while interactively prompting the operator to enter keywords for each list. Any typing errors detected by the operator or by validation procedures can be corrected on the spot.

DATA ENTRY IN A TYPICAL MICROS APPLICATION



Finally, MICROS provides three facilities for examining and editing the catalog itself.

* GLOSSARY creates a printed index from the catalog, for both editing and back-up purposes. Partial listings (for a specified range of keywords in a list) are available, as are other options for printing. Output can go directly to the optional MICRO 4000 line-printer, or to magnetic tape for later use.

* FIX is an on-line program for interactive corrections to one keyword at a time.

* MODIFY handles modifications which require access to the entire catalog; this program runs unattended. It included "aging" functions, such as the ability to purge all references ot a given (obsolete) film cassette or cartridge.

Appendix 3

Micros Technical Summary

ZYTRON DATA SYSTEMS

MICROS TECHNICAL SUMMARY

The MICRO 4000 is an enhanced version of the Microdata Corporation "REALITY" machine, a virtual-memory timesharing minicomputer system which includes microcode implementation of its operating system and file system primitives. For example, the file system is supported in part by a microcoded "move until delimiter" instruction which transfers up to 64,000 bytes at 2.5 memory cycles/byte.

1.1 Virtual Memory and File System

All non-monitor data references are made to the virtual memory (disk) address space, rather than into core memory; the monitor automatically queues a page fault task if the referenced 512-byte "frame" is not core-resident. Thus the same software can execute without change on different core configurations: increasing the amount of core memory on the system increases throughput by reducing the statistical frequency of page faults. Since object programs also reside in virtual memory, they can be coded in a reentrant fashion and shared among multiple users, each owning a private control section of "Process Work Space".

Frames in virtual memory file space are linked together in both forward and backward directions, with the operating system maintaining an available-space pool, without "sliding" data. Fragmentation is handled by repacking available space during reload from a system-save tape.

Data structures are organized in the system by a hierarchy of dictionaries. The system dictionary, starting at a fram location known to the monitor, contains the names and starting locations of all master dictionaries. Each master dictionary is uniquely associated with a username (log-in name), and contains the names and starting locations of all files belonging to that username.

A file may contain any number of "items", where the term "item" corresponds to "variable-length-record" in conventional usage. Items are stored and retrieved within files using a semi-direct access method. The starting location of the file division, or "group", is calculated by applying a hashing algorithm to the item-ID (up to 49 characters), with this calculation parameterized by file-structure information stored in the dictionary item which points to the file.

Once the group starting location is known, a sequential search algorithm is invoked. The ID at the beginning of each item is examined; if it is not the desired ID, the search skips down the group by the exact amount of the item size (stored as a field at the beginning of each item). Item size can be as large as 32,000 bytes. Groups can expand by attaching

frames from the available-space pool for the purpose of adding new items (appended to the end of the group) or allowing for the expansion of an item: item updates are handled by copying the item into a Process Work Space, deleting the item by sliding subsequent group items back down over it, and then appending the new version (modified in the Process Work Space) to the end of the shortened group.

1.2 Timesharing

During a log-in session, each user terminal is associated wtih a unique I/O communication port, either directly (by cable) or indirectly (by communications modems and telephone lines). Each such association defines a "process" and each port owns a unique "process work space" are in virtual memory, allowing independent operations to occur among the different terminals.

At log-in time, the process is furthermore associated with a particular master dictionary which specifies the data structures, programs, and privileges available to that process. Thus a given set of users may have access to the same data if they are logged into the same username, or may be denied access to each other's data if they are logged into different usernames. It is also possible to grant access rights to selected files and programs across usernames. Fox example, all usernames are given mutual access to a common set of utility programs and system commands.

The monitor allocates a 100-millisecond quantum of computation to each eligible (logged-in) process in round-robin discipline. A process is deactivated upon quantum runout or occurrence of a "roadblock" condition such as a page-fault, terminal output buffer full, or terminal input requested.

2. MICROS

The MICROS data structure is supported by the MICRO 4000 file system. There may be up to ten "catalogs" on one MICRO 4000 system, with a given user name referencing one such catalog. Catalogs are structurally significant not only because each provides an independent schema for organizing data, but because they define the scope of uniqueness for film references (i.e., the reference "roll 1/page 1" may refer to two different film images across catalogs, but not within one catalog). Each catalog allows for up to 15 "lists", or categories for index terms. Categorization is necessary to avoid ambiguity; for example, the keyword "SMITH" in a police record system must be identified as name of arresting officer or name of arrested person. Partitioning a catalog into several smaller structures also speeds processing.

2.1 Data Structures

The key structural concept in the MICROS system is that of inverted list design. Rather than storing a file of records keyed on film reference, with associated index terms appearing as fields in each record,

the index terms are extracted for use as record keys (itemID's) with all associated film references appearing within the index term records. This organization minimizes storage requirements while facilitating retrieval by keyword.

The basic mechanism in the implementation of this structure is the "Body-File": there is one Body-File per list category in each catalog. A Body-File is a "file" in system terms; its constituent items are called "keyword entries" (i.e., their item-ID's are the index terms themselves). (Since MICRO 4000 "items" are limited in size, a keyword entry may actually involve several "continuation items". These are identified by appending a special character and an integer tag to the spelling of the index term.) The keyword entries in turn contain representations of the associated film references, sorted within the entry.

Storage compression is achieved within the entry by representing roll numbers non-redundantly: each roll representation is followed by four-byte representations of the pages within the roll. Each roll representation is furthermore preceded by a system delimiter byte, to take advantage of the firmware "scan to delimiter" and "move through delimiter" capabilities.

The structure thus far would support simple varieties of retrievals, since any keyword entry can be accessed directly through the system hashing algorithm. The SEARCH program, however, also provides for retrievals on the basis of "greater than", "begins with the left abbreviation", and "contains the characters". Two enhancements are necessary to support these retrievals.

First, each keyword entry in a Body-File includes a pointer to the next higher-sorting entry, thus forming a forward-linked chain. This enables the retrieval software to handle multiple-keyword retrievals without accessing all items in a body-file.

Second, each Body-File is accompanied by a "Finder-File", which serves as a dictionary for rapid determination of a starting point within the Body-File chain. Each Finder-File contains the names of the earliest sorting keywords in the corresponding body-file which begin with any given character or pair of characters. For example, if a Body-File contains SLOANJ, SMITHC, SMITHJ, and SMYTHEQ, the Finder-File will contain the entry SMITHC in the "SM" position. A retrieval for "names beginning with the characters SMITH" need not follow the body-file chain from its very beginning.

In addition to the main structures, two types of auxziliary files are of interest: "UPDATE MESSAGES" and "SEE-ALSO MESSAGES".

The UPDATE MESSAGE file (one per catalog) provides a mechanism for associating digitized text data with a film reference. Item-ID's are the film reference numbers themselves; item contents are text that will be displayed automatically when the corresponding film is referenced as a result of a search. Update message text can be entered, deleted, or modified on-line. Up to 32,000 characters of text may annotate any single film reference.

As suggested by its name, the "SEE-ALSO MESSAGE" file is used to annotate keywords. Text is displayed when the corresponding keyword is encountered during retrieval operations. There is one such file per list. It's items (the "SEE-ALSO MESSAGES") may be created, deleted, or modified on-line.

2.2 Search Strings and Retrieval Operations

Searching is the process of logically combining all film references which meet a specified set of criteria (the "search string") to arrive at a table of occurences (the "hit table"). This table can then be used to drive film on special terminals, or it can be listed for off-line film viewing.

Search strings are formal representations of criteria which can be quite complex. For example: Find all microfilm immages in the personnel database whose index information refers to the following:

1. A job skill which is either accounting or finance.

2. An annual salary between $16,000 and $18,000.

3. A year-of-hire before 1972.

4. A present department code beginning with the letters ABC.

Free-field ordering of multiple criteria, infinitely nested parentheses, and other features are implemented in the translation of search strings.

The SEARCH program first parses the string into its component parts and decides upon the correct order of operations to perform. The basic operations are the logical, or Boolean, combinations of keyword entries (or previously calculated hit tables) into hit tables, using one of the three Boolean functions AND, OR, and NOT (AND-NOT). A higher level of function determines the meaning of a search term mapped onto list retrieval: searches can be made against exact spelling, left-abbreviation, universal character match, ranges, and less-than or greater-than. The retrieval operations themselves may involve creating temporary "buffer" hit tables. For example, DEPT=PURCHASING and SALARY> 15000 requires flip-flopping, using AND and OR primitieves, over successive keyword entries in the SALARY body file, since the method of first OR'ing all the data selected from the SALARY Body-File might cause an unacceptable amount of storage to be used.

2.3 Hit-Table Use

When the SEARCH program has successfully computed a final hit-table as the result of a search, it prints a message indicating the number of occurrences and makes the table available to the user. Several options may now be exercised.

The user can cause the corresponding film images to be displayed on a microfilm terminal; the program translates the desired elements in the hit table into a film driving command which is transmitted to the terminal either indirectly, through the MICROFILM TERMINAL INTERFACE unit, or directly. Hits may be displayed successively; the current position in the table may be altered forward or backward by an number; or the user may "browse" forward or backward through neighboring film images without losing his place in the hit-table.

The hit-table remains available and unaltered throughout all its uses, until the next search command is executed. "Uses" in this sense include display-mode perusal, the "list hits" (print) command, and a special list for later incorporation into other search strings. The latter capability saves both typing time and computational delay, if a series of similar search requests is anticipated.

It is also possible to continue the search, starting with the current hit talbe. If the number of hits is too small, the user can relax the criteria and expand the hit table by continuing with an "OR" function. If the number of hits is too large, the user can narrow the criteria by continuing with an"AND" or "NOT" function. This procedure can be repeated indefinitely. Hit tables are stored in MICRO 4000 file items, allowing as many as seven to eight thousand hits per table.

3. Data Entry

Data Entry items, containing new associations between index terms and film references, can be entered directly from a terminal or indirectly via magnetic tape. Such items can be accumulated in a central "GENDATA" file (unique to each user name), and then merged into the SEARCH data structured by the GENERATE program.

3.1 Original Data Entry

3.1.1 Input

The INPUT program repetitively prompts the terminal user for data. The data is syntax-checked according to specifications predefined in the application, and is appended tp previous lines in a file associated with the port. (Thus, several users can simultaneously use INPUT while logged into the same user name.) The contents of these files can later be copied into the GENDATA file. The normal method of operation is to enter all index terms for one frame of film before proceeding to the next frame. The line-editing functions of backspace, retype, and line-cancel are available during entry.

3.1.2 Magnetic Tape Input (MTI)

The MTI program reads a formatted magnetic tape into the GENDATA file, creating a chain of continuation-items if necessary by appending increasing integers to the user specified item-ID.

3.1.3 Editor

The system text editor may be used to create items in GENERATE format, either in the GENDATA file or in a secondary file whose contents can be copied into GENDATA at a later time. The EDITOR is also available for checking and modifying items created by INPUT or MTI.

3.2 Generate

The GENERATE program processes items in the GENDATA file, merging the specified index-term/film-reference associations into the MICROS data structure. Multiple items can be processed, since the program automatically looks for continuation items (e.g., when started on item MONDAY, it will automatically proceed to items MONDAY1, MONDAY2, etc.).

Although normally operated at a time of low SEARCH activity (i.e., as part of an "OVERNIGHT" job stream), the GENERATE program can run concurrently with the SEARCH program. Both programs test and set a common table of "locks" which protect against simultaneous access errors.

4. Catalog Maintenance

In addition to growth by data entry, catalogs occasionally must experience change for maintenance reasons. For example, a common requirement is the purging of associations between index terms and references to film which has been "aged" out of the on-line retrieval plan. Other maintenance functions include the correction of index-term spelling errors which have been incorporated into the catalog, or the changing of erroneous film references caused by filming errors.

4.1 Modify

The MODIFY program includes all functions which require catalogwide access. The user can specify single roll/page references, page ranges within rolls, and/or entire rolls to be deleted from the catalog, or single reference changes to be made; any combination of these functions may be specified. MODIFY should be run during a designated maintenance period (such as over a weekend), since it must rebuild an entire catalog.

4.2 Fix

The FIX program operates on-line for immediate corrections within a single specified keyword. It includes all the MODIFTY functions plus the facilities to delete a keyword entry, change keyword spelling and merge the film reference tables of two keywords.

5.0 Glossary

A printed representation of all or part of a database is useful for both backup and maintenance purposes. The Glossary program provides

three dimensions of choice for printing a specified list.

A. The output device can be specified as the interactive terminal, the system line printer (if on the system), or magnetic tape. Multiple-reel continuations are implemented for tape. This tape is formatted as a print-tape for the optional line printer.

B. Range, either an entire list or a portion of a list, can be processed by specifying the beginning and ending keywords.

C. The format can be specified as either "keywords only" or detailed".

   The latter prints all film references within each keyword. Roll-numbers are printed non-redundantly. Page references within rolls are printed across the page in repeating row format, and a total film-reference count appears at the end of each keyword entry.

6.0 System Accounting

A system accounting file is accessed at log-in and at log-out time. Records are kept by username of date and time logged in, connect time, and CPU seconds used.

The accounting file can be interrogated for these data, summary totals of them, and charges based upon connect time and CPU time accumulated, using the commands ACC-DETAIL and ACC-SUMMARY. AN additional command, ACC-CLEAR, prepares the file for the next reporting cycle.

Appendix 4

NBC User Manual for Micro 4000 System

CONTENTS

SECTION 0

INTRODUCTION TO THE MICRO 4000 SYSTEM

0.1 INTRODUCITON
0.2 MICRO 4000 HARDWARE COMPONENTS
0.3 MICRO 4000 DATA ELEMENTS
0.4 MICRO 4000 SYSTEM FUNCTIONS
0.5 GENERAL SYSTEM OPERATING INSTRUCTIONS

SECTION 1

GENERAL FUNCTIONS

1.1 INPUT
1.2 SEARCH/RESEARCH
1.3 REVIEW
1.4 TRACK/TRACKT
1.5 ENTERING THE ABSTRACT (ABS.INPUT)
1.6 LISTING THE ABSTRACTS (ABS.LIST)
1.7 POSTMAN/MAIL

SECTION 2

SUPERVISORY FUNCTIONS

2.1 ARCHIVE
2.2 GATHER
2.3 GLOSSARY
2.4 NEW-FILM
2.5 AUTHORITY FILE MAINTENANCE
2.6 REVIEW-OK
2.7 OVERNIGHT
2.8 HOLD-RESTORE
2.9 SYNONYMS
2.10 CLEAR-LOCKS

CONTENTS

SECTION 3

SYSTEM MAINTENANCE FUNCTIONS

3.1 SAVE400

3.2 FAST-SAVE

3.3 SYSTEM RESTORE

3.4 POWER UP

3.5 POWER DOWN

3.6 PASSWORD CHANGING/SYSTEM RE-GEN.

3.7 MAGNETIC TAPE HANDLING

3.8 MISCELLANEOUS

3.9 PACK COPY

SECTION 4

APPENDIX

4.1 FIX/MODIFY

4.2 CREATE ACCOUNT
CREATE CATALOG
DELETE CATALOG

4.3 EDITOR

4.4 DISK CONTROLLER CONTROLS

SECTION 0

INTRODUCTION TO THE MICRO 4000 SYSTEM

0.1 INTRODUCTION

0.2 MICRO 4000 HARDWARE COMPONENTS

0.3 MICRO 4000 DATA ELEMENTS

0.4 MICRO 4000 SYSTEM FUNCTIONS

0.5 GENERAL SYSTEM OPERATING INSTRUCTIONS

0.1 Introduction

The MICRO 4000 System is a computer-aided method of indexing and retrieving microfilmed documents. The system is basically made up of three components:

1. Hardware - The actual equipment used by the system to perform its various functions.

2. Data Elements - Information stored within or accessed by hardware, usually under software control.

3. Software - Computer programs designed to capture and manipulate information within the system.

The interaction of the above components, under direction of a human "user", constitutes a "system".

This section will briefly summarize each of the above components and provide operating instruction for the most basic system functions.

0.2 MICRO 4000 Hardware Components

The actual equipment configuration of a given MICRO 4000 System may vary depending upon customer requirements and, over the life of a system, usually changes. Generally, however, the MICRO 4000 system consists of the following components:

A. The MICRO 4000 Central Processing Unit, consisting of:

1. a mini computer
2. core memory
3. disk storage devices
4. a magnetic tape unit
5. communications channels
6. system console

B. MICRO 4000 Workstations which may consist of one of the following:

1. Keyboard/CRT Display Terminal
2. Keyboard/Hardcopy Terminal
3. Keyboard/CRT Terminal in conjunction with a microfilm reading device.

C. MICRO 4000 Hardcopy unit which maybe a keyboard/hardcopy terminal or a high-speed line printer device.

0.3 MICRO 4000 Data Elements

The data elements of the National Broadcasting Company's MICRO 4000 System are:

A. The Microfilm Data Base: Microfilmed images of Library Abstracts and related incoming and/or final input forms. The microfilm images reside in roll film cartridges and are referenced by a cartridge and page number.

B. The Catalog: A searchable collection of keywords or descriptors which reference a particular Library Abstract. The catalog is organized into seven lists, or categories of descriptors. They are:

1. Media I.D. (ID)
2. Date of Event (DE)
3. Date of Receipt (DR)
4. Source (SO)
5. Personalities (PE)
6. Subject (SU)
7. Place (PL)

This searchable catalog is kept on the MICRO 4000 disk storage where it may be accessed by a keyboard terminal device for data entry and searching. By searching the catalog for particular descriptors within the seven categories of information, film references for desired Library Abstracts may be quickly obtained. The film reference may then be used to automatically display the Abstract on the microfilm reader or to produce a computer display of media-related technical data.

C. The Media Information File: A computer based set of records, corresponding to the Library Abstracts, used for terminal display. These records contain all information found on the incoming and/or final input forms. They are organized by a machine assigned accession number and cross-referenced to the corresponding Library Abstract's film reference number. These records are notsearchable but are displayable as a result of a successful search of the catalog.

D. The Abstracts File: This is a computer based data file used to input and temporarily hold the Library Abstracts prior to printing and filming.

E. The Authority File: This is another computer based file containing the equivalent of a Thesaurus. Before any descriptor is added to the searchable catalog it is checked against the authority file. If the descriptor is not found on the authority file it is flagged for subsequent review.

F. The Hold File: This is a computer based file into which all new input is temporarily placed. After the new incoming or final data is reviewed and approved it will then be removed from the hold file and added to the catalog and media information files.

G. Synonyms: A computer based file containing terms declared to be synonymous with specified keywords within a list in the catalog.

0.4 MICRO 4000 System Functions

The system functions fall into three categories:

1. General Functions - available to any user with access to the user names NBC, FTLEE, or SUPER;

2. Supervisory Functions - Available only to users with access to the user name SUPER; and,

3. System Maintenance Functions - available to users with access to the user name SYSPROG.

System functions are performed either by following a hardware procedure or by executing a software program via a terminal display device. Detailed procedures for performing these functions will be found in subsequent portions of this document.

Following is a brief summary of the program and procedures available:

A. General Functions

1. INPUT: The entry of keywords and other information from incoming and final forms into the system via a terminal keyboard device. Entered data is held in a temporary file (hold) for subsequent:
   -review and modification
   -analysis for vocabulary control (utilizing the Authority file)
   -generation into the catalog and media information files.

2. SEARCH: The capability of locating desired library abstracts or media information by searching the catalog for specified keywords or combinations of keywords and automatically displaying the information.

3. RESEARCH: A highly prompted version of search with the added feature of optional inclusion of previously established synonyms. Because it is highly prompted, RESEARCH is a valuable tool for the novice or occasional user without the synonym option. The option to automatically include synonomous search terms provides an additional dimension to searching. Synonomous terms must be established in a separate step before RESEARCH can include them. See "SYNONYMS".

4. REVIEW: This program examines input data in the hold file and:
   -Checks each searchable term against the authority file.
   -Prints an image of the information input from a final or incoming form on a hardcopy terminal, indicating those search terms not found on the authority file.

   The system user indicates which data is desired by providing the proper accession numbers(s).

5. TRACK/TRACKT: These programs provide an abbreviated status listing of information in the hold file by accession number. They

are most often used in conjunction with the REVIEW program. TRACK is used for obtaining a hardcopy printout. TRACKT is for CRT display.

6. ABS. INPUT: This procedure is used for entering the Abstracts into the system. It utilizes the MICRO 4000 "Editor" functions to accomplish this.

7. ABS. LIST: This procedure provides an uneditted listing of abstracts on the system according to a specified accession number or numbers. These listings are then available for microfilming.

8. POSTMAN: The ability to leave messages on the system for later reading by others:

9. MAIL: The ability to display messages left on the system by other users via the POSTMAN program.

B. Supervisory Functions

1. ARCHIVE: This program will provide a sorted listing of accession numbers for all abstracts in the abstract file. It will then write the abstract file to magnetic tape and completely clear out the file.

2. GATHER: Given a keyword or range of keywords within a list, this program will provide a sorted listing of the keywords and a count of how many references to the keyword(s) exist on file.

3. GLOSSARY: Provides a listing of all accession numbers for a given keyword or set of keywords within a list.

4. NEW-FILM: This program cross-references an accession number to a corresponding film reference number (cartridge/page). This must be done before film images of Library Abstracts can be automatically displayed.

5. AUTHORITY: This function allows terms to be added to or deleted from the authority file.

6. REVIEW-OK: This is the funciton by which the supervisor indicates that a record in the "HOLD" file has been reviewed and may be generated into the catalog during the next overnight run.

7. OVERNIGHT: The "HOLD" file is written to tape for daily back-up and the reviewed data is generated into the system. This must be done in order to make information searchable.

8. HOLD-RESTORE: This function will re-load a previously saved "HOLD" file. This may be necessary in case of a system malfunction requiring restoration of a previous version of the system in order to recover daily input.

9. SYNONYM: This program allows synonyms to be added, deleted, or changed for a particular keyword within a list. Synonyms are used by the RESEARCH program.

10. ALL SYNS: Provides a lisitng of all synonyms currently on the system.

11. CLEAR-LOCKS: The MICRO 4000 System uses what are termed "locks" to prevent multiple users from modifying the same bit of information at the same time. It is possible that these "locks" may not unlock properly on occasion. This procedure will correct that situation should it arise.

C. System Maintenance Functions

1. SAVE400: The complete back-up of a 400MB system to tape in a highly structured format.

2. FAST-SAVE: The complete back-up of a 400MB system to tape in a completely unstructured format.

3. SYSTEM RESTORE: The restoration of the system from a back-up tape by a manual procedure.

4. PACKCOPY: Copying of the system disk packs from pack to pack for back-up purposes. This procedure is considerably faster than saving the system on tape.

5. COLD-START: System initialization procedure. Allows the setting of date and time.

6. PASSWORD: A program to establish and maintain user name passwords for system security.

7. ACC-CLEAR: The MICRO 4000 automatically maintains system accounting information. This program clears the accounting files.

8. ACC-SUMMARY: This program provides a summary report of system accounting information.

9. ACC-DETAIL: This program provides a detail report of system accounting information.

10. CREATE-ACCOUNT: This program will establish a new user name.

11. CREATE-CATALOG: This program will create a new searchable catalog.

12. DELETE-CATALOG: This program deletes an entire searchable catalog.

0.5 General System Operating Instructions

This section will discuss the most basic system operating procedures which every user should be familiar with.

Communication with the MICRO 4000 System is accomplished through terminals connected to the system by direct cables or a telephone modem. Every effort has been made to keep communication as simple and "English" oriented as possible. In some cases, however, certain shorthand codes are used or a particular sequence of events must be followed to properly use the system. A careful reading of this section will familiarize the new system user with the techniques required to begin.

A. Basic Concepts

1. When a terminal is properly logged on but no active task has been started, the system is said to be in the "executive mode". This mode is indicated by the presence of a dash (-) at the extreme left of the display. This is referred to as the "executive prompt" charachter and signifies that the system is ready and awaiting instructions.

2. After the user has typed in instructions or data, the system must be told to accept this information and act upon it. This is done by pressing the "NEW LINE" key. On some terminals this key is referred to as the "carriage return" or just "return" key. This documentation sometimes uses the shorthand expression (NL) or (NEWLINE) to indicate that the "NEWLINE" key should be depressed. An exception to this is found in the search function where the control key and the "S" key are pressed simultaneously to initiate a search.

3. Occasionally it is necessary to simultaneously press the "control" key and some other key ("S", for example). This documentation will refer to such a procedure by using the word "control" followed by a dash and the proper key to be simultaneously pressed (eg., CONTROL-S). Care should be taken to avoid accidentally pressing the control key, especially in data entry functions. Note that the control key is positioned where the "shift-lock" might be found on a typewriter.

B. Using the Keyboard

When any key on the keyboard is pressed, that character is transmitted to the system and stored. When the user has finished typing a line and is ready for the system to process it, the "NEW LINE" key should be depressed or, when in SEARCH, the "CONTROL" and "S" key should be pressed simultaneously.

1. Editing Characters

Should any mistakes be made while entering a line they may be corrected by using the editing characters <u>prior</u> to pressing the "NEW LINE" or "CONTROL-S" keys.

a. Delete a character (CONTROL-A) -
Simultaneously pressing the "CONTROL" key and the "A" key will cause the preceding character to be deleted. Repeating this process will delete additional preceding characters.

b. Delete a line (CONTROL-Q or -X)
The entire line being typed may be deleted by simultaneously pression the "CONTROL" key and the "Q" or "X" keys. Again, this must be done before the "NEW LINE" key is typed.

c. Retyping the current line (CONTROL R)
The use of editing characters may cause confusion as to what actually remains on the line. Simultaneously pressing the "CONTROL" key and "R" will retype the current line for ease of reading.

2. Warning Bell
If a charachter has not been properly received or the system is in a state where it cannot process the character or command, it will respond with a warning tone. This indicates that the operator should retype the character.

3. "BREAK" Key
Sometimes it is necessary to stop a process that has been initiated before it is complete. To do this, simultaneously press the "CONTROL" and "BREAK" keys until an exclamation point (!) appears. At this point two commands are available:

a. "END" - this command will terminate the process and return to the executive prompt (-) where another process may be initiated.

b. "G" - this will allow the interrupted process to continue.

WARNING: Only the above two commands should be issued at this point.

C. Entering the System (Logging In")
A terminal to be used must be logged in to access the MICRO 4000 System. The following procedure shows the steps necessary to log in a terminal.

1. Turn power on.
2. Check switch settings required for on line operation. If using the MICRO 4000 terminal (ADDS) the mode switches "Roll" and "Full Dup" should be depressed. If other terminal types are used obtain operating instructions from the system supervisor.
3. Press the "NEWLINE" key. The system should respond with the message:

PLEASE LOG IN;

If not, and an exclamation point (!) appears, the terminal is still logged on. If this occurs type "END", press "NEW LINE" key, type "OFF" and proceed with step 3.

4. Enter a valid user name, a comma, and a legal password if required followed by pressing the "NEW LINE" key:

   "USER NAME, PASSWORD (NL)

   Errors or invalid data at this point will cause the "PLEASE LOG IN" message to be repeated.
5. If proper information has been entered, the system will display the system name, date and time, and, after a brief pause, the message:

   "LOG IN COMPLETE"
6. The executive prompt character, a dash (-) will then appear at the left of the screen signifying that the system will now accept valid instruction.
7. If the terminal being logged in is a hardcopy terminal, the user will be asked to specify paper size.
8. At times it may be helpful to log in to a new user name from an old one without taking the time to go through the complete log-on and log-off procedure. This may be done, assuming the user is properly authorized, by using the "GFD" function.

   At the executive prompt (-) type:

   -GFD USERNAME, PASSWORD (NL)

   For example, if you are logged in to the user name "Super" and want to log into "SYSPROG", type:

   GFD SYSPROG, (password for SYSPROG) (NL)

D. Leaving the System ("Logging Out")

Before turning the terminal off or when leaving the terminal for long periods of time, the user should log out by typing the command:

"OFF" (NL)

The system responds by displaying the connect time, CPU units used, and date and time followed by the "Please Log In" message. The terminal may now be powered off.

SPECIAL NOTE: If the terminal is accidently powered off or physically disconnected prior to logging out the terminal will remain logged in. When the terminal is powered on, the screen will display a exclamation point (!). At this point type "END" and the "OFF" to logoff the terminal.

E. Legal and Illegal Characters for MICRO 4000

Following are lists of legal and illegal characters. The illegal characters should not be used, particularly as SEARCH keywords or INPUT data as they will be rejected by the system:

LEGAL CHARACTERS

$ % * + - & ? 0 1 2 3 4 5 6 7 8 9 .
A B C D E F G H I J K L M N O P Q R
S T U V W X Y Z

(Backward Slash) (Brackets)

ILLEGAL CHARACTERS

/) (: # =) (' " @ ; !

SECTION 1

GENERAL FUNCTIONS

1.1 INPUT

1.2 SEARCH/RESEARCH

1.3 REVIEW

1.4 TRACK/TRACKT

1.5 ENTERING THE ABSTRACT (ABS.INPUT)

1.6 LISTING THE ABSTRACTS (ABS.LIST)

1.7 POSTMAN/MAIL

1.1 INPUT

A. Introduction

"INPUT" is the function which allows entry of new data or modification of existing data in the MICRO 4000 System. Data to be entered into the system is obtained from completed incoming and final film or video-tape forms and key-entered using a CRT display terminal and the INPUT program.

As the data for each incoming or final form is entered it is assigned a sequential accession number and placed in an intermediate "HOLD" file on disk storage. In seperate steps, this information will be subsequently reviewed, corrected if necessary, and approved for entry to the system. It will then be generated into the searchable catalog and the displayable media information files where it may be searched and retrieved. At a later time the microfilm reference numbers (cartridge/page) of corresponding Library Abstracts will be cross-referenced to this information enabling the automatic retrieval of these documents.

The data entry function is a key element in the successful operation of the system. If data is not entered accurately and consistently then it will be impossible to retrieve as needed. While the INPUT program has been designed to be as flexible and self-checking as possible, it is important that each person using the system be familiar with proper input formats and standards (for instance, the proper format for entering a persons name.) A time-worn but true cliche in the data processing industry is "garbage in - garbage out".

B. INPUT - Program Summary

INPUT is a highly prompted program which allows data to be entered to the MICRO 4000 System from four different types of input form:

- Incoming film
- Incoming video
- Final film
- Final video

INPUT may also be used to modify or delete existing information that was previously entered into the system.

The INPUT program consists of two distinct phases, or passes, for each record; the Input pass; and the checker pass. In addition, Abstracts may be entered if a record is changing status from incoming to final.

1. INPUT pass - the input pass accepts from the keyboard an entry for each type of data allowed for the type of form being entered. The name of each data field to be entered is displayed on the screen in sequence and an operator reply is awaited. At the end of the input pass, the operator will be shown in compact form all data entered during this pass. The operator may then choose to proceed to the next entry if everything is correct or to go into the checker pass if corrections are required. If the operator has entered an accession number for a record that already exists

on file, the program will display the existing record and proceed directly to the checking pass on operator command.

2. CHECKER pass - After the entire record is displayed, and upon operator command, the checker pass will display the entered data one line at a time, allowing the operator to: accept, modify, add, or delete, information. The checker pass may be performed as often as the operator wishes. At the end of each checker pass the entire record will be displayed again and, if the record is accepted, it will then be entered to the "HOLD" file.

3. ABSTRACT input - If the status of a record is being changed from incoming to final, the input program will allow the operator to enter corresponding Abstract data as the last phase of the program. Abstract Input may also be done in a seperate step.

C. Input Considerations and Restrictions

1. In total, some fifty-six different items of information may be entered into the system from incoming or final film and video forms. Syntax checking is done on many of the items to insure proper formats. All of the data items and their proper formats will not be listed here. Following, however, is a list of the types of checks performed:

   a. Length - many items are restricted in length.
   b. Dates must be all numeric in the format YYMMDD (where y = year, m = month, and D = Day).
   c. Time must be entered in the form HH:MM (where H=Hour, M=Minute).
   d. Some data items are checked for the presence of only numeric or only alphabetic data.
   e. A "Y" or "N" response is required for certain data items and no other response will be accepted.
   f. Some data items are required to be present.

2. Multiple input is allowed for several data items (such as subjects or places).

   Seven of the data items entered will be generated into the searchable catalog (Media I.D., date of event, date of receipt, source, subject, personalities, and place). Data entered for these items are subject to the following restrictions:

   a. A searchable term may not exceed 45 characters.
   b. A searchable term may not contain any of the following illegal characters:

   c. A searchable term may not contain the words "AND", "OR", "NOT".

D. INPUT operating instructions

1. Input should be done on a CRT display terminal. The terminal must be powered on and logged in to a valid user name.

2. At the executive prompt (-), type:

   INPUT (NL)

3. The program will then request that the operator enter status by displaying the message:

   "ENTER 'STATUS':"

   >_

   Valid responses are:
   a. "I" or "F" for incoming or final. The proper response is determined by the form being followed for input.

   b. "Q" or "QUIT" to terminate the Input program.

   c. All responses are followed by pressing the "NEWLINE" key.

4. The program will then request that the operator:

   "ENTER 'MEDIA':"

   >_

   Valid responses are:
   a. "F" for Film
   b. "V" for Videotape
   c. All responses are followed by pressing the "NEW LINE" key.

5. Next, the program will request:

   "ENTER 'ACCESSION NO':"

   >_

   Valid responses are:
   a. If this is a new record being input for the first time merely press "NEWLINE" without entering any data. The program will assign an accession number and display it on the screen, then proceed to the next prompt. The accession number should be noted on the input form.

   b. Enter a valid seven digit accession number ONLY if:
      b1. You wish to correct an existing record in the master file or hold file. In this case, STATUS and MEDIA must also be the same as the record being called for. The program will then display the entire record as it currently exists and gives the operator the option of accepting it or going to the checker pass. (See "Checker Pass")

b2. You wish to create a final record corresponding to a previously input incoming record. In this case the media type entered ("F" or "V") should be the same as for the previously input record, but status should be "F" instead of "I". The sequence of events explained in item "C" below will then take place.

b3. Any other responses will generate error messages and return to the first prompt, "STATUS".

c. If an accession number is input for which an incoming record already exists on file, and if the status entered in step 3 is "F" (final), the program assumes that an attempt is being made to create a corresponding final record. The following events take place:

c1. The program will display:

"STATUS OF ITEM IS NOT 'F'"
"CREATE A 'FINAL' ITEM WITH A NEW ACCESSION NO.? (Y/N)_"

c2. A "N" response to the above will cause the program to go to step 3 and request "STATUS" again. A "Y" response will cause the program to assign an accession number to the final status item and transfer all relevant information from the incoming record to the final. The record will then be displayed and the checker pass option given. (See step 9 "Checker Pass").

c3. The checker pass will function normally with one exception: at time the operator responds "Y" to the question at the end of the display "IS ITEM OK? (Y/N)", additional questions will be asked relating to deletion of the incoming record and entering of abstracts. (See step E)

6. The next request for entry, if entering a new item, will be:

ENTER 'ID NO':
>_

A valid response is the media I.D. number. From this point on the program will request, item by item, that the operator input data relevant to the form being entered. A prompt will be displayed as with the previously described items and the operator will enter the corresponding information as found on the input form.

Note that several data types allow input of multiple keywords (places, subjects, etc). In these instances, one item per line should be entered followed by "new line". The prompt will appear again and allow input of another item. If no more items exist for that data type, merely press "new line" without entering any data and a prompt for the next data type will appear.

Following are valid responses to all prompts:

a. Enter the data being requested as found on the form keeping proper format in mind.

b. Press "new line" if no data is available to display the next prompt. If data is required a message will be displayed and the program will not be allowed to go to the next prompt.

c. Entering a $E followed by pressing "new line" will escape the input sequence and go back to the beginning. All items input for this accession number will be dropped.

d. Where specific syntax or format is required, the program will display messages if the data entered does not meet the requirements. In most cases, the messages describe the proper format required.

7. After the last item for a record has been input and "NEW LINE" pressed, the entire record will be displayed in compact form. IF it takes more than one screen to display the record, the program will stop after the first screen until the operator presses "new line".

8. After the entire input record has been displayed the operator will be asked:

"IS ITEM OK? (Y/N)

Valid responses are:

a. "Y" - The program will enter the record in the hold file
   a1. If the record was an "INCOMING" item then: the operator will be asked: "ENTER (NL) TO CONTINUE" When (NL) is pressed the program will go to step 3 (status) and input continues with the next record.
   a2. If the record was a "FINAL" item then the operator will go to step E.

b. "N" - This response will initiate the checker pass. It should be given if any modifications are necessary to the input data.

9. The "Checker" pass will go through each data item one at a time and allow additions, deletions or modifications of data. The pass will begin with "ID NO" (Media I.D.) since no modification of status, media or accession number is allowed at this point.

The general format of each display is:

======ENTER 'ITEM NAME':

<CURRENT DATA>_

Valid responses at this point are:

a. Pressing "newline" will move the prompt to the next entry. It will not affect the data itself.

b. Entering new data on the same line where previously entered data exists will replace the previously entered data.

c. Entering a $D followed by "new line" will delete the entire entry on that line.

d. Entering a $K followed by "new line" will cause the entire record to be dropped. The operator may then return to the beginning of INPUT (STATUS-step 3) to start entering a new record or to re-enter the record just killed.

e. Entering a $T followed by a two digit number representing a data item and then pressing "newline" will cause the program to jump directly to the data item represented by the two digits. For instance, if the prompt is currently at "IDNO" (Item 3) and the operator wishes to go directly to the "cameraman" (item 12) the operator would press the "$" and "T" Keys, then enter the number 12, and then press "new line".

f. Entering a $E will escape the checker pass from any point. The input record will be redisplayed and, if necessary, the operator can go through the checker pass again as often as required.

g. Entering "$Rn/old-word/new-word/(newline)" will cause the nth occurance of "old-word" to be replace with "new-word". If you omit "n", the 1st occurance is used.

h. ENTERING "$IB/new-word/(newline)" will cause "new-word" to be inserted at the beginning of the line.

i. ENTERING "$IE/new-word/(new-line)" will cause "new-word" to be inserted at the end of the line.

j. ENTERING "$In/word/new-word/(new-line)" will cause "new-word" to be inserted after the nth occurance of "word". If you omit "n", the 1st occurance is used.

k. ENTERING "$Dn/start-word/end-word/NEWLINE)" will cause deletion of words from the nth occurance of "start-word" thru "end-word."

Note: Items g thru k above are expanded editing commands to replace, insert, and delete information. The same commands are used in correcting abstract and synopsis data. The current data as corrected will be redisplayed after use of the editing commands for possible additional correction.

E. Entering ABSTRACTS VIA the "INPUT" program

These procedures are followed when a "final" record is being created. After the checking pass phase of final record input is complete, the operator will be given an opportunity to delete the incoming record and create an abstract as follows:

1. After responding "Y" to the prompt "IS ITEM OK (Y/N)", the following message will be displayed:

   "DO YOU WISH TO DELETE THE ORIGINAL INCOMING ITEM? (Y/N)"

   a. A "Y" response will delete the incoming record corresponding to the newly created final record and the program will proceed to the next prompt. This should only be done when the operator is certain that all cut stories, etc. are accounted for.
   b. A "N" response will cause the program to display the next prompt.

2. If there is no abstract in the "ABSTRACT" file for the current accession number the operator will be asked:

   "DO YOU WANT TO ENTER AN ABSTRACT? (Y/N)"

   a. If the answer is "N" the program will continue as for an "INCOMING" item (see step 3).
   b. If the answer is "Y" then the operator will enter an abstract. This sequence is exactly the same as in the program "ABS.INPUT". After the abstract has been entered, checked, and filed (or killed), the program will continue as for an "INCOMING" item (step 3).

3. If an abstract exists in the "ABSTRACT" file for the current accession number the operator will be asked:

   "DO YOU WANT TO VIEW OR CORRECT THE ABSTRACT? (Y/N)"

   a. If the answer is "N" the program will continue as for an "INCOMING" item (step 3)
   b. If the answer is "Y" then the operator will follow the correction sequence as described for the program "ABS.INPUT". After the abstract has been checked and filed (or killed), the program will continue as for an "INCOMING" item (step 3).

E. Operating Instructions for SEARCH

SEARCH is a free-form approach to entering keywords and operands in order to locate data which has been entered to the system. It prompts the user very little. Remember throughout the following discussion that the entire object of Search is to produce a display of a film image or of computer based media information record.

The following procedure assumes that the operator is thoroughly familiar with terminal keyboard operation and the material discussed in the Introduction and Search Strings sections.

1. When ready to begin, simply type:

   "SEARCH"

2. The system will respond with:

   S:__

3. At this time enter search parameters according to guidelines and examples in the Search Strings section.

4. When the parameters have been entered, simultaneously press the CONTROL key and "S" to initiate the search.

5. The system will respond with the number of hits and S:__

6. At this time new search parameters may be entered followed by "CONTROL-S", OR:

7. A "Q" may be typed in response to the search prompt (S:). This will cause the system to enter display mode and allow the user to examine the actual film records or computer based information corresponding to the "hits" found. See Section on RECORD AND FILM DISPLAY.

8. Alternately, additional keywrods may be entered at this time to continue the current search (ie to reduce the number of hits) or to initiate a new search. Note: To continue a search, the word "AND" or "OR" or "NOT" must precede any keyword(s).

9. % SAVE of hit tables may also be done at this time (see advanced techniques section).

10. A list of valid search categories maybe obtained by entering:

    LIST? (NL at the S: prompt)

11. "SEE ALSO" messages may be entered at any "S:" prompt.

F. RESEARCH - OPERATING INSTRUCTIONS

The searching technique "RESEARCH" is intended for the occasional user who may not be overly familiar with terminal use or searching techniques. Although complex searches may be performed with "RESEARCH" it is best to use the SEARCH PROCEDURE in such cases. RESEARCH, however, has the additional capability of including synonymous search terms. (SEE SYNONYMS)

1. Some helpful things to keep in mind are:

   a. The terminal must be powered on and properly logged in before use.

   b. All commands or entries are followed by pressing the "NEWLINE" key.

   c. "RESEARCH" is capable of locating information given relatively few known factors. However, the information must have been entered into the system at some previous date before it can be found.

   d. It is best to search on the most specific information possible. For instance, MEDIA ID is a very specific reference. If the user knows this number, no other descriptor is likely to be needed to locate the information.

   e. More detailed information on searching is available in the introduction and search logic sections of the user manual.

2. When the user is ready to begin simply type:
   "RESEARCH" (followed by pressing NEWLINE)

   a. If synonyms are to be used, the user responds 'Y' to the question "Do you want to include synonyms"?

3. The system will respond by displaying on the screen a list of the searchable categories and positioning the cursor at the first category.

4. The operator may now take the following actions:

   a. If the Media ID number is known, enter it now and press the "NEWLINE" key to advance to the next category. Even if no descriptor is entered at a particular category, pressing "NEWLINE" will advance to the next category in sequence.

   b. Typing a "$n" (where n = line number of the desired category) will move cursor directly to a specific category where the appropriate descriptor(s) may be typed or a correction made.

c. Typing a "." (Period, NEWLINE) at any category or typing "NEWLINE" alone when at category 7 (Places) will terminate descriptor entry.

d. Typing a "$D" when at any category will delete any information already entered there. For instance, if an entry at category 5 (Personalities) needs to be deleted type: "$5" (to move the cursor to category 5) "$D" (to delete the descriptor at category 5)

5. When descriptor entry is terminated (see 4.C above) the following message will be displayed:

```
CORRECTIONS? ($N,Q, NEWLINE ) -
      TYPE NEWLINE TO START SEARCHING
      TYPE $N TO RETURN TO LINE N
      TYPE Q TO TERMINATE RESEARCH
```

Respond appropriately. Any response other than those above will initiate searching specified by the message:

a. "Would you like to view keys encountered". A response of all 'Y' will result in a display, at a search time, of all keys encountered which were included because of a range or subset search.

When the system proceeds to perform the search, it will inform the user by printing the following message:

SEARCHING

b. During the search, a display is provided, for educational purposes, of the legitimate search constructions used to evaluate the input criteria. It is the Aim of Research to expose the user to Conventions and techniques of using the "search" program to do meaningful Research.

When the search is complete the system will display the search parameters and number of "hits", if any, followed by the message:

```
VALID OPTIONS NOW:

1. EXAMINE HITS (TYPE E)
2. INCLUDE ADDITIONAL SEARCH TERMS (TYPE A)
3. RESEARCH SOMETHING ELSE (TYPE R)
4. TERMINATE FIND PROGRAM (TYPE Q)

OPTION SELECTED (Type E,A,R,Q):_
```

a. Options 2 and 3 return user to the RESEARCH program and display the list of category names on the screen, followed by the previously used terms if any.

b. Option 1 will enter the display mode and allow the user to

view either the actual film record or the media information corresponding to the "hits" found.

RESEARCH - REMINDER NOTES

1. Terminal must be logged in
2. Type "RESEARCH" to enter program
3. Enter appropriate descriptor at category name where cursor is located.
4. Valid commands are:
   a. "Newline" key to advance to next category.
   b. "$n" (where n = line number of desired category) to skip directly to a specific category.
   c. "." to terminate descriptor entry.
   d. "$D" to delete a descriptor.
5. Other communication with the system is prompted by appropriate messages which are self-explanatory

G. Displaying Film or Records

1. Quitting from SEARCH; Entering DISPLAY
After a successful search has been completed, and the

S:_

prompt appears, the Searcher may display the computer records and film images which satisfy the SEARCH criteria. The Searcher "quits" from SEARCH by responding:

S:Q (N)

The question

***** DISPLAY (Y OR N)?__

appears on the Screen. There are two responses possible:

a. An "N" response brings the prompt:

TYPE 'NEW LINE' TO RETURN TO SEARCH OR 'Q' TO QUIT:?

a1. A response of NEW LINE only returns to the prompt

S:__
and more searches may now be started.

a2. A response of "Q" returns to the "executive mode" prompt (-).

b. A "Y" response blanks the screen, and the Main Display Prompt:

DISPLAY: RECORDS (R)
: FILM (F)
: BOTH (B).
: HITS (LH)__

appears in the upper part of the screen.

In addition to the R,F,B, or LH responses, the "Q" response allows the Searcher to "quit" back to either SEARCH or "executive mode".

The "R", "F", "B", and "LH" responses are described in detail below.

2. Record Only Display (R)

This form of display is a special one for it allows marking of records for later film display. This will be described in detail below.

The message:

MARK RECORDS FOR FILM DISPLAY? (Y OR NEW LINE):__

appears. There are two responses:

(A) "Y" causes an additional message to appear with the record display, and the Searcher is given the chance to MARK the record. This means that an automatic film display will occur for each marked record after all records have been displayed.

(B) NEW LINE only causes marking to be ignored.

***

Now the record display begins.

The MEDIA RECORD for each hit from SEARCH is shown on the screen.

Press NEW LINE to continue:

or

Press NEW LINE to continue or 'M' TO MARK:__

appears after the display, depending on whether the marking option was chosen.

The record may be marked, or passed. In any case, all records for all hits are displayed, and when the entire list of hits is exhausted, the Main Display Prompt appears:

DISPLAY: RECORDS (R)
: FILM (F)
: BOTH (B)
: HITS (LH) __

Any of the responses R,F,B,LH, or Q may again be made.

3. Film Only Display (F)

In this form of display, each abstract which is a "hit" is displayed on film. The program will request the operator to mount a specific cartridge and press new line.

When the display is complete, the prompt:

ENTER: '+'/'_' (Bump), 'N' (Next), NEW LINE (continue), Q (Quit)

appears, and the responses are:

(a) ⟨NEW LINE⟩ or 'N' only moves to display the next hit.

(b) '+' ⟨NEW LINE⟩ - bumps the page number up by one and displays that page.

(c) '-' ⟨NEW LINE⟩ - bumps the page number down by one and displays that page.

When all film images are shown (all hits have been displayed), the Main Display Prompt appears.

4. Both Film and Record Display (B)

In this form of display, for each hit, its corresponding Abstract and computer record are simultaneously shown.

All options available under Record Only (R) or film Only (F) are available under (B) with the exception of marking.

5. Listing the Hits (LH)

An ordered list of each accession number appears on the screen.

6. Returning to the Main Display Prompt

At any point during Display where prompting for keyboard input occurs a response of

"Q" (NL)

only returns to the Main Display Prompt:

```
DISPLAY:  RECORDS (R)
      :   FILM (F)
      :   BOTH (B)
      :   HITS (LH)
```

(Of course, the "Q" response to this prompt will "Quit" out of display completely.)

1.2 SEARCH/RESEARCH

A. Introduction

The primary purpose of the MICRO 4000 System is to provide a means of locating microfilmed images of documents. This is accomplished by using a sophisticated combination of computer programs and equipment to capture reference information pertaining to the documents and make the information available to be searched.

In many ways the MICRO 4000 System could be compared to a card catalog in a conventional library. For each book in a library an index card containing information about the book, including where to locate it, is placed in the catalog and cross-referenced according to such criteria as Title, Author, and Subject. The library user can go to the catalog and locate the book or books desired without having to look at every book in the library. Similarly, the MICRO 4000 maintains a catalog of index information pertaining to documents on file, also cross-referenced, which may be searched. In this case, however, the computer itself is searched using a communications terminal.

The MICROS data entry and update programs, discussed in detail elsewhere, are used to put information into the catalog. Two techniques are provided for searching the catalog. They are appropriately called SEARCH and RESEARCH.

The SEARCH program is a free-form technique with very little prompting. It is used by the experienced searcher.

RESEARCH is a highly prompted program which guides the user through each step. It is very usefull for the occasional or novice searcher. It has an additional powerful option of being able to include synonymous terms in the search if any exists.

In each case a keyword or combination of keywords are entered into the system as search criteria. If the keyword exists within its list (ie., subject, place, etc.) in the catalog, all film references for that keyword are made available to the searcher who may then automatically display the actual film images and/or display corresponding computer based information for the documents being sought.

Detail operating procedures for SEARCH and RESEARCH will be found at the end of this section. The intervening pages will discuss search logic and concepts. It is important that the searcher be familiar with this material in order to most effectively utilize the MICRO 4000 capabilities.

Remember that searching is primarily a problem solving function. It requires that the searcher think analytically and be familiar with the system capabilities. It may be helpful to keep the following two questions in mind:

1. WHAT AM I LOOKING FOR?
2. HOW CAN I FIND IT?

B. The Searchable Catalog
The catalog is kept on magnetic disk storage. It is divided into seven categories, or lists. They are:

	NAME	ABBREVIATION
1.	Media I.D. number	ID
2.	Date of Event	DE
3.	Date of Receipt	DR
4.	Source	SO
5.	Personalities	PE
6.	Subject	SU
7.	Place	PL

Corresponding keywords (sometimes called descriptors) are entered into the proper categories. These keywords reference a Library Abstract which has been microfilmed. The seven lists may be searched for keywords which pertain to an abstract of a film or videotape story. If found, the corresponding microfilm references (cartridge/page) are provided and the searcher may examine the abstracts or computer based technical information relating to the media story being sought. This searching is done according to rules and procedures which follow.

C. Search Strings
The search string is the set of criteria provided by the searcher which enables the SEARCH program to select the desired film references and build a "hit" table. A "hit" table consists of the list of references which meet the search criteria.

1. Elements of the Search String
There are four elements which are combined according to certain rules to form the Search String. They are:
   a. List name -the category to be searched.
   b. Search Logic -the manner in which the category is to be searched. The possibilites are equal to (=), greater than (>), less than (<), begins with (:), and range (/).
   c. Keywords -the actual data within a category which relates to the document being sought.
   d. Operators -AND, OR, and NOT; these operators are used for combining or excluding search terms.

   Every search string must contain these elements, either implicity or explicitly.

2. Search Logic
The search logic determines the way a given keyword will be looked for within a list. Following is a brief explanation of each of the five types:

	Type	Symbol	Description
a.	Equal	=	Search the list for a keyword equal to that specified.
b.	Root (or Colon)	:	Search the list for a keyword that "begins with" the characters following the colon.

	Type	Symbol	Description
c.	Greater than	>	Search list for all keywords "greater than" that specified.
d.	Less than	<	Search the list for all keywords "less than" that specified.
e.	Range	/A,B	Search the list for all keywords greater than or equal to item A but less than or equal to item B.

3. Operators
Search strings may be constructed to look for various keywords in different lists with different search logic all in one statement. Many combinations are possible through the use of the three logical operators, AND, OR and NOT.
   a. "AND" operator - when this operator is used all of the search conditions combined by the "AND" must be true before a hit will occur.

   b. "OR" operator - In this case, a hit will occur if any of the search conditions connected with this operator are true.

   c. "NOT" operator - A hit will occur only if the search condition stated is not true, that is, if the keyword does not appear in the category as searched.

4. Restrictions and Considerations
   a. A keyword used in SEARCH may not exceed 45 characters.
   b. Certain characters are not allowed in search and will be rejected they are:

      /)(: #) (' " @ ; !

      These characters should never be input at data entry.

   c. The "Universal" character "#" may be used in a search string to replace characters in a keyword which are not known. For example, if a date list is being searched for an event that happened in January of 1976 but the day is not known it could be stated as 7601##.

   d. The first value in a range search (/) must always be lexicographically lower in value than the second value.

   e. It is possible, when a system is created to specify default search categories and logic. For the NBC system the default category is SUBJECT and the default search logic is the root search(:). This simply means that if just a keyword is specified as search criteria, with no category or logic, the program will assume that the subject category is to be searched for keywords that "begin with" the stated keyword.

5. Examples - How to specify simple SEARCH statements.

The following examples assume that the SEARCH program is being used. Search criteria are entered in this program when the prompt "S:" appears. Remember the items required in a search statement: category; search logic; keyword being searched for; connecting operators (AND,OR,NOT) as required. The categories used in these examples are the seven searchable NBC categories signified by their two letter abbreviations.

SEARCH STATEMENT	MEANING
a. S: ID= 1234567	Find all information for Media ID number 1234567.
b. S: DR/ 760101,760115	Find all information for media received between Jan. 1, 1976 and Jan. 15, 1976 inclusive.
c. S: PL: SANT	Search for all information pertaining to places beginning with the letters "SANT".
d. S: ID<1234567	Find all information for Media ID numbers less than 1234567.
3. S: CARTE	Search for all subject references with "CARTE". Note that the category (su) and search logic (:) were not stated. These are default options.
f. S: PE=FORD GERALD R and SU = CAMPAIGNS	Find all information on media which deal with Gerald R. Ford and campaigns. Note that both conditions must be true. Media dealing with Ford but not with campaigns would not be located.
g. S: SU= DEMONSTRATIONS OR SU = PROTESTS OR SU = STUDENT UNREST	Find all media references which deal with the subjects demonstrations, protests, or student unrest. If any one or more of these keywords are found, a hit will be generated.
h. S: SU: REAGAN NOT PL = WASHINGTON	Find all media references which concern Reagan as the subject but do not involve the place Washington.

D. Advanced Searching Techniques

1. Complex Operands

A search statement containing more than one operand is often called an "expression". An example might be the search statement "S: PE: FORD AND PL = MICHIGAN". Each element of the search string seperated by "AND" is an operand. When combined with "AND" they form an expression.

It is sometimes necessary to combine these expressions with other operands or expressions creating Comples Operands. Generally, these complex are characterized by the fact that parenthesis are used to contain one or more of the expressions which make up the complex operand. Parenthesis are necessary to insure that an expression is handled as a unit when the search string is evaluated (which is done algebraically, see below).

Going a step further, it is also possible to have parenthesized espressions contained within other parenthesized expressions. When this is done the expressions are said to be nested. Care must be taken when stating a complex search string such as this to insure that the desired results will be obtained. One rule to keep in mind is: when specifying a complex search where one or more parenthesized expressions occur an equal number of left and right parenthesis must be present.

The following are some examples of complex searches:

a. S: PE=FORD GERALD R AND (PL=WASHINGTON OR PL=MICHIGAN OR PL=CAMP DAVID OR PL=VAIL)
In this example a "hit" would occur for every media record in which Gerald Ford was indexed as a personality and a place keyword of Washington, Michigan, Camp David, or Vail was entered. If the parenthesis were left out a "hit" would occur for every record in which Gerald Ford was indexed as personality and Washington was indexed as place. In addition, a hit would generate for every record in which MICHIGAN, CAMP DAVID, OR VAIL was indexed as place regardless of whether FOR was indexed or not.

b. S: PE=KISSINGER HENRY A DR AND (SU=PEACE OR SU=NEGOTIATIONS and (PL=MIDDLE EAST OR PL=ISREAL NOT PL=SAUDI ARABIA)

A hit would occur only if a media reference was found which was index with at least the following Keywords:

Personality = Dr. Kissinger; AND,
Subject = Peace or Negotiations; AND,
Place = Middle East or Isreal

However, a hit would not occur, even if the above conditions were all met, if a place keyword of Saudi Arabia existed.

2. Evaluation of Search Strings

Search strings are evaluated as follows:

a. Operands are combined left to right using the separating operators.
b. Parenthesized expressions are completely evaluated as encountered with the result replacing the expression in the search string.
c. Evaluation is continued until an error is encountered or until the end of the search string is encountered.

3. The Hit Table - % Save

The process of searching a catalog requires an intermediate holding area for film references which satisfy the search criteria. This area is known as the "Hit Table". As the hit table is being constructed, it is compared against each keyword specification according to search logic and operators, so that each specification that is found to be a hit modifies the current hit talbe by increasing or decreasing its size. This hit table may then be used to drive the microfilm reader or display media information on the workstation screen.

The hit table may be saved for future use. There are three commands used to save, list, and delete these saved hit tables. They are called the Percent Commands, because they operate on a reserved "List" called "%". The command descriptions follow:

a. %SAVE

At the "S:" prompt the user types %SAVE (NEWLINE)

S: %SAVE
The computer responds
"NAME?
the user then specifies the name he wishes to give this hit table. The name must follow the conventions for alpha list keyword naming. If that name has already been assigned, MICROS responds with

ALREADY EXISTS!

(NO ACTION)

and re-prompts with S:

If the hit table has zero hits, the system prints

NO HITS!
(NO ACTION)

b. %LISTS

At the "S:" prompt, the user may type %LIST (NEWLINE)

S: %LIST

The system responds with a list of all saved hit tables.

Hit 1
Hit 2
Hit 3
etc.

c. %DELETE

The %DELETE command is used to delete a previously saved hit table, by typing %DELETE (NEWLINE)

S: %DELETE

The system responds with %NAME?
The user then specifies the name of the hit table he wishes deleted from the "OLD" list. If the specified name does not exist, the system responds with-

NOT FOUND
(NO ACTION)

If the item is found, system responds with "OK".

Saved hit tables may be used in search strings, much the same as any other keyword specification. This is valuable because many complex searches sometimes use common specifications which can be identified. By building a separate saved hit table of these common specifications one eliminates re-processing for every different search request.

This feature can save considerable time if a significant portion of the search criteria has already been processed:

Let us assume the user is using the "SU" List and "PE" list. Further, assume that 90% of all inquireies will be concerned with research concerning Ford and his congrssional activities. Then by creating a saved hit table of only those stories which belong to this subject area the user will significantly reduce search time for 90% of all of these searches. The user need create this table only as often as he finds necessary, depending upon the frequency of adding new data to the list. It is far easier for the system to read an already existing hit table than it is to create it in the first place.

As an example:

S: PE= FORD GERALD R. AND SU= CONGRESS

200 HITS

```
S:  %SAVE
%NAME FCON
O.K.
S:  %=FCON AND SU=APPROPRIATIONS
11 HITS
S:  %=FCON NOT SU=APPROPRIATIONS
1 HITS
S: %DELETE
NAME FCON
O.K.
```

4. "SEE ALSO" MESSAGES

"SEE ALSO" messages are a body of text that may be associated with a keyword within a list. The messages are created at the "S:" prompt and will appear during search at the time a hit is encountered.

"SEE ALSO" messages are created in the following manner:

a. At the "S:" prompt type "SEE"
b. The system will then ask the user to specify the following:
   "LIST:" - one of the valid searchable category lists.
   "KEYWORD:" - the Keyword to which the message is to be attached.

   "MESSAGE:" - The message desired.

c. Messages may be deleted by going thru the above process specifying the same List and Keyword but no message.

d. Messages maybe replaced by going thru the above process specifying the same list and keyword but entering a different message.

e. Messages maybe extended by specifying the same list and keyword but following the "MESSAGE:" prompt with a "+" (plus sign) followed by the addition to a message.

   Examples follow.

```
S:SS
LIST:PE
KEYWORD:SMITH MARY
MESSAGE:MARY SMITH MARRIED BILL JONES
S:PE=SMITHMARY
MARY SMITH MARRIED BILL JONES
2 hits
S:
See also messages may be extended, replaced, or deleted.
S:SEE
LIST:PE
```

KEYWORD:SMITH MARY

MESSAGE:+ON JANUARY 21, 1971, SEE JONES

S:PE=SMITH MARY

MARY SMITH MARRIED BILL JONES

ON JANUARY 21, 1971, SEE JONES

2 hits

S:SEE

LIST:NAME

KEYWORD:SMITH MARY

MESSAGE:_____

S:SMITH MARY

2 hits

S:Q

5. NBC - Special Search Note

The initial NBC database includes information that was formerly on another type of system. This information was converted directly from the old system to the new. Certain characteristics of the old system were, therefore, carried over. Specifically, keywords in some categories (most notably the Personalities and Subjects categories) have single or double asterisks appended to them indicating the context in which the keyword relates to the actual media story. The coding is as follows:

a. A single asterisk appended to a keyword indicates an "actual" contextual relationship to the media.

b. A double asterisk indicates a reproduction or aftermath.

c. No asterisk means the media story is about the subject or personality.

The presence of these asterisks may affect the manner in which searches are conducted.

1.3 REVIEW

A. Introduction

The purpose of the REVIEW program is to provide a means of final verification of all input before allowing the data base to be updated. The program deals only with input data in the "HOLD" file and previously entered abstracts.

REVIEW goes through the following steps:

- Accepts accession numbers from an operator.
- Finds the records in the "HOLD" file.
- Checks input data for places, personalities, and subjects against the authority file.
- Prints a list of all terms checked against the authority file if they do not appear on the authority file.
- Optionally prints media and abstract records.

The REVIEW program should be run on a hardcopy terminal.

The REVIEW program is related to several other programs and manual procedures. A general sequence of events might be as follows:

- Run the TRACK program to identify what accession numbers are on the "HOLD" file.
- Run the REVIEW program, entering the accession numbers for the items desired.
- Manually edit the media information and abstract printout for accuracy and make corrections.
- Research any search terms that were listed as not being on the authority file make a proper record of it.
- As necessary, use the REVIEW-OK program to approve those records which can be added to the data base.
- Run overnights as necessary.
- Update the authority file as required.

B. Operating Procedure

1. A hardcopy terminal should be logged to a valid user name.
2. At the executive prompt (-), type:

   REVIEW (NL)

3. After asking for the output device type, the program will display:

"DO YOU WANT ABSTRACT LISTINGS? (Y/N)"

Answer "Y" if you want ABSTRACT listings after each MEDIA record listing.

4. The program will the print:

"ENTER ACCESSION NO(S) AND/OR 'END' "

Valid responses are:

a. "END" to terminate program.
b. A single accession number (leading zeros are not required).
c. A string of accession numbers seperated by commas. (nnnnnnn, nnnnnnn, nnnnnnn).
d. A range of accession numbers seperated by a dash. (nnnnnnn-nnnnnnn).
e. Any combination of the above.

The program will then produce for each accession no. entered:

a. A display of the media record.
b. A listing of the terms which are not on the AUTHORITY FILE.
c. Abstract listing, if requested in step 3.

When all accession numbers have been processed, the program will return to step 4 (unless "END" was the last entry in the list keyed in step 4).

1.4 TRACK/TRACKT

A. Introduction

The "TRACK" programs produce an abbreviated listing of all data records on the "HOLD" file at a given point in time. Several types of information are printed.

The most obvious uses for the TRACK programs are:

- to obtain accession numbers for use with the review program.
- to get a status report on hold file data, particularly, how many "reviewed" items are on file.

If a hardcopy is desired the program "TRACK" should be executed from a hardcopy terminal. If a CRT display is desired the "TRACKT" version should be used.

B, OPERATING Instructions

1. Log in to the display device desired.

2. At the executive prompt (-) enter:

   TRACKT (NL) (or TRACK)

1.5 ENTERING THE ABSTRACTS (ABS-INPUT)

A. Introduction

This procedure allows the input and correction of Library Abstracts in the MICRO 4000 System for later printing and microfilming. You should note that the functions provided in ABS-INPUT are also provided in the INPUT procedure. Formatted listings of completed Abstracts can be produced using the ABS-LIST, REVIEW or REVIEW-OK procedures.

B. Operating Procedure

1. Log into a terminal (if not already logged in)
2. At the executive prompt (-), enter -ABS-INPUT⟨NEWLINE⟩
3. The program will ask the questions:
   ENTER ACCESSION NO.⟩
   Then enter one of the following:
   a. "Q" or "QUIT" to terminate the program
   b. A seven digit accession number
      (leading zero not required)
4. If you enter an accession number in step 3 the program will look in the ABSTRACT file to see if an abstract already exists. If one does exist the program will proceed to step 5. If an abstract does not exist the program will proceed with the prompting sequence for a new abstract:

   a. The program will display:
      ------PARAGRAPH 1--------
      Then will ask the operator:
      ENTER PARAGRAPH HEADER ⟩
      You then enter the header for the paragraph, terminating with ⟨NEWLINE⟩. If no paragraph header is desired just enter ⟨NEWLINE⟩
   b. The program will then display:
      ENTER PARAGRAPH BODY ONE LINE AT A TIME and will prompt with a three digit line number ("001"). After the line number prompt enter one line of abstract text terminated with ⟨NEWLINE⟩. The program will continue to prompt with 3 digit line numbers until ⟨NEWLINE⟩ is entered after the prompt. At this point the paragraph is complete.
   c. The program will then ask:
      MORE PARAGRAPHS TO ENTER? (Y/N)⟩
      If you enter "N" the program will proceed to step 5. If you enter "Y" the program will return to step 4a allowing entry of another paragraph.

5. The program will next display:
   DO YOU WANT TO DISPLAY THE ABSTRACT? (Y/N)⟩

If you enter "N" the program will proceed to step 6. If you enter "Y" the abstract will be displayed one paragraph at a time. Each paragraph is displayed with 3 digit line numbers, the paragraph header being line 000. If your terminal is a CRT the program will display:

ENTER⟨NEWLINE⟩TO CONTINUE

after each paragraph.

6. The program will then display:

IS ABSTRACT OK? (Y/N/K)⟩

Valid responses are:

a. "Y" - will cause the ABSTRACT to be filed in the ABSTRACT file and the display:
ABSTRACT FOR ACCESSION NO nnnnnnn FILED IN THE ABSTRACT FILE
The program will then proceed to step 3.
b. "N" - will cause the program to proceed with step 7.
c. "K" - will cause the abstract to be "KILLED" (i.e. deleted from the ABSTRACT FILE) and the display:
ABSTRACT FOR ACCESSION NO nnnnnnn KILLED.
The program then proceedes to step 3.

7. The following sequences allows the correction of an abstract. The program will ask:

DO YOU WANT TO CORRECT OR DELETE ANY PARAGRAPHS? (N/C/D)⟩

Valid responses are:

a. "N" - will cause the program to proceed to step 9.
b. "C" will cause the program to ask WHICH PARAGRAPH?⟩
After you enter the number of the paragraph which you want to correct the program will proceed to step 8.
c. "D" will cause the program to ask: WHICH PARAGRAPH⟩
After you enter the number of the paragraph which you want to delete that paragraph will be removed and all paragraphs below will be moved up one. The program then proceeds to step 9.

8. This step allows the correction of an existing paragraph.

a. The program will ask:
PARAGRAPH HEADER IS "header-text" - OK? (Y/N)⟩
If you enter "N" the program will ask:
ENTER PARAGRAPH HEADER⟩
After you enter the new paragraph header the question at 8a is again asked. This sequence will repeat until the answer is "Y".
b. After the paragraph header is OK you are given the opportunity, one line at a time, to correct the paragraph body. Each line will be displayed prefaced by the line number and the program will ask:
CORRECTIONS?⟩

Valid responses are:

a. "E" - to end the correction sequence for this paragraph. The program will proceed to step 9.

b. ⟨NEWLINE⟩ to accept the lines as displayed and proceed to the next line.

c. Any of the editing commands: R, IB, IE, I or D. When you use these editing commands the corrected line will be re-displayed for possible additional correction:

- "Rn/old-word/new-word/⟨NEWLINE"⟩
- will cause the nth occurance of "old-word" to be replaced with "new-word". If you omit "n", the 1st occurance is used.

- "IB/new-word/⟨newline⟩"
causes "new-word" to be Inserted at the Beginning of the line.

- "IE/new-word/⟨newline⟩"
causes "new-word" to be Inserted at the End of the line.

- "In/word/new-word/⟨newline⟩"
causes "new-word" to be Inserted <u>after</u> the nth occurance of "word". If "n" is ommitted, the 1st occurance is used.

- "D ⟨newline⟩"
causes the entire line to be deleted.

- "Dn/start-word/end-word/⟨newline⟩"
causes Deletion of words from the nth occurance of "start-word" <u>thru</u> "end-word". If "n" is ommitted, the 1st occurance is used.

9. The program will next ask:

DO YOU WANT TO ADD ANY PARAGRAPHS? (Y/N)

If you enter "N" the program will proceed to step 5. If you answer "Y" then the input sequence will be performed for a new paragraph (see step 4) and step 9 will be repeated.

1.6 LISTING THE ABSTRACTS (ABS-LIST)

A. Introduction

This program will provide a listing of an abstract on a hardcopy terminal for editting and filming purposes. The program requires that the operator supply the accession number and produce a listing. Note that abstract listings may also be produced by the review program.

B. Operating Instructions

1. Log in a terminal to a valid user name.

2. At the executive prompt (-) enter:

   ABS-LIST (NL)

3. The program will display the request:

   ENTER ACCESSION NO(s) AND/OR "END"⟩

Valid responses are:
a. "END" to terminate the program
b. A single accession number (leading zeros not required)
c. A series of accession numbers separated by commas
d. A range of accession numbers separated by dashes
e. Any combination of the above.

The program will then produce an abstract listing for each accession number then return to step 3 (unless "END" was the last entry in the list keyed in step 3.

1.7 POSTMAN/MAIL

A. Introduction

These programs provide a vehicle for leaving messages on the system to be read by other users. This capability is very convenient for posting warning or status messages for people who maybe using the system later and for communicating to remote sites. "POSTMAN" allows messages to be left on the system. "Mail" reads messages left on the system.

B. Operating procedure - POSTMAN

1. At the executive prompt, type:

   POSTMAN (NL)

2. The program will display the following messages

   a. "INPUT YOUR NAME"
   b. "INPUT NAME OF USER TO SEND MAIL TO" (respond with valid system username
   c. "Input text (TYPE "END" WHEN FINISHED)"

      Note: after entering last line of text, press new line, then type "END" (NL).

   d. The message "MAIL WAITING (TYPE MAIL)" will now appear at the recipients user name.

C. Operating Procedure - MAIL

1. At the message "MAIL WAITING (TYPE MAIL)", TYPE "MAIL" (NL).

2. The text of the message will display followed by the message:

   "DELETE THIS MAIL? (Y/N)"

   a. "Y" - will delete the mail.
   b. "N" - will leave the mail on the system.

SECTION 2

SUPERVISORY FUNCTIONS

2.1 ARCHIVE

2.2 GATHER

2.3 GLOSSARY

2.4 NEW-FILM

2.5 AUTHORITY FILE MAINTENANCE

2.6 REVIEW-OK

2.7 OVERNIGHT

2.8 HOLD-RESTORE

2.9 SYNONYMS

2.10 CLEAR-LOCKS

2.11 LIST-AUTH

2.1 ARCHIVE

A. Introduction

The ARCHIVE program does three things:

1. Produces a sorted listing of abstract accession numbers currently in the ABS. HOLD file.
2. Writes a magnetic tape image of all abstracts currently on the file.
3. Completely clears the file out.

The program should be executed from a hardcopy terminal.

B. Operating Procedure

1. Log into the system on a hardcopy terminal.
2. Mount a magnetic tape on the tape unit.
3. At the executive prompt (-), type ARCHIVE (NL).
4. After printing the report, writing the tape, and checking the tape for parity errors, the followign message will display:

   "WERE THERE ANY PARITY ERRORS (Y/N)"

   a. "N" - dismount and label tape - Program will now clear the abstract file.

   b. "Y" - dismount tape, label it bad, clean tape heads, mount a new tape, and re-start the job.

2.2 GATHER

A. Introduction

GATHER is a statistical reporting program. Given a category and keyword range, it will list the keywords and provide a count of the number of documents on the system with that keyword.

B. Operating Procedure

1. Log in on a display terminal and at the executive prompt (-), type:

   GATHER (NL)

2. At the prompt "INPUT CATEGORY" enter the name abbreviation of a valid search category.

3. The system will ask "Output to Printer (Y/N)". Answer "Y" only if a line printer exists on the system.

4. The system will then prompt:

   "INPUT BEGINNING KEY" ; followed by,
   "INPUT ENDING KEY"

   Valid responses are:

   a. "NEWLINE" will cause beginning and/or ending keys to be set to low and high values, respectively.

   b. Enter a low and high keyword range for which you would like statistics compiled.

2.3 GLOSSARY (GLOSS)

A. Introduction

The glossary program produces a report, on magnetic tape, terminal, or printer, of keywords specified and their associated film references. The program will accept ranges of keywords or print all keywords for a category.

B. Operating Procedure

1. Log in on a display terminal and, in response to the executive prompt, type =

   GLOSS (NL)

2. The following establish program execution logic:

   a. Input DB Name (Data Base Name)

   b. Input List Name? (List or category name)

      Q or Quit will terminate program

   c. Input Beginning Key? (Keyword)

   d. Input Ending Key? (Keyword)

      If no character is entered just a carriage return then everything from Beginning Key to the Last Film Reference will be listed.

3. The following prompts establish output options

   a. Is output for IBM MAG TAPE, PRINTER or TERMINAL (M/P/T)?

      'M' (mag tape)
      Is mag tape attached (Y/N)?
      'Y' If tape not attached will terminate with ERROR MESSAGE
      'N' Program terminates with ERROR MESSAGE

      'P' (Printer)
      Has Line Printer characteristic's been set (Y/N)?

      'Y' Listing will go to Line Printer
      'N' Program terminates with ERROR MESSAGE.

      'T' (Terminal)
      No other prompting until listing has completed one page on terminal.

      Type ⟨Newline⟩ to continue
      Q or Quit ends operation.

2.4 NEW-FILM

A. Introduction

"New-Film" provides the cross reference between accession number and film reference number (cartridge/page). At the time incoming and final records are input, filming of the abstracts has not yet taken place; therefore a film reference number is not available for generation with the searchable keywords. An arbitrary sequential accession number is used instead of film reference number. If, when the microfilmed abstracts are available, automatic retrieval of the abstract film as a result of a successful search is to be possible, the cartridge/page number of the abstracts must be cross-referenced to the accession numbers of the computer based records.

B. Operating Procedure

1. Log in to a display terminal and at the executive prompt, type:

   NEW-FILM (NL)

2. Place the cartridge of film to be indexed in the microfilmed reader.

3. The program will display the message:

   "ENTER CASSETTE NUMBER"

   Valid responses:
   a. A 3-digit numeric cassette number
   b. "Q" or "QUIT" will terminate the program

4. The system will then request:

   "ENTER STARTING PAGE NUMBER"

   a. A 4-digit numeric page number is the only valid response.

5. After the page number is entered the system will display:

   . . . ? : _

   Valid Responses are:

   a. The valid seven digit accession number you wish cross referenced to this page. The above prompt will appear again in case more than one cross reference is desired for this page.

   b. "NEWLINE" pressed without entering anything will advance to the next page.

   c. "Q" or "Quit" will refile the current cassette and return to step 3 above.

d. "B" will back the film up one page.

e. "Bn"; where n= a page number will move film in reverse the number of pages stated in "n".

f. "F" will advance the film one page.

g. "Fn" will advance the film the number of pages specified by "n".

6. When finished, entering a "Q" at the prompt in step 5 and a "Q" at the prompt in step 3 will terminate the program.

2.5 Authority File Maintenance

A. Introduction

This function allows terms to be added to or deleted from the Authority file.

B. Operating Procedure

1. Log into a display terminal and, at the executive prompt (-) type:

   AUTHORITY (NL)

2. The Program will display:

   "ENTER TERM"

   Valid responses are:
   a. Enter the exact term to be added or deleted.
   b. Newline without entering data will terminate the program.

3. Then the program will request:

   "ENTER ACTION"

   Valid Responses:
   a. "A" for Add the Term
   b. "D" for Delete the Term

2.6 REVIEW-OK

A. Introduction

This program allows the system supervisor to approve input data in the "HOLD" file for generation into the data base. This step will normally be performed on only those records that have gone through the "REVIEW" process and corrected if required.

B. Operating procedure

1. Log in to a display terminal and, at the executive prompt, type:

   REVIEW-OK (NL)

2. The program will ask:

   DO YOU WANT TO SET THE REVIEWED FLAG? (Y/N)>

   Answer "Y" if you want the selected records to be released for an OVERNIGHT run.

3. The program will ask:

   DO YOU WANT MEDIA LISTINGS? (Y/N)>

   Answer "Y" if you want listings of the selected MEDIA records.

4. The program will ask:

   DO YOU WANT ABSTRACT LISTINGS? (Y/N)>

   Anwser "Y" if you want listings of the selected ABSTRACTS

5. If the answer given in step 4 was "Y" the program will ask:

   DO YOU WANT TO WRITE ABSTRACTS TO TAPE? (Y/N)>

   If you answer "Y" then each selected abstract will be copied to the file ABS. HOLD and deleted from the ABSTRACT file. The actual writing of an ABSTRACT to tape is done with the ARCHIVE procedure.

6. The program will then ask:

   ENTER ACCESSION NO(s) AND/OR "END">

   Valid responses are:
   a. "END" to terminate the program.
   b. A single accession number (leading zero not required)
   c. A series of accession numbers separated by commas
   d. A range of accession numbers separated by a dash
   e. Any combination of the above

7. The program will then, for each accession number and depending on the answers given in steps 2-5:

   a. Set the REVIEWED flag in the MEDIA records allowing these records to be used in the next OVERNIGHT run
   b. Produce a listing of the MEDIA record
   c. Produce a listing of the ABSTRACT record
   d. Copy the abstract to the ABS. HOLD file and delete from the ABSTRACT file

   When all accession numbers have been processed the program will return to step 6 (unless the last entry in the list entered in step 6 was "END").

2.7 OVERNIGHT

A. INTRODUCTION

"OVERNIGHT" is the supervisory function which:

1. Saves the contents of the holding file ("HOLD") on magnetic tape. (HOLD-SAVE tape)

2. Saves the contents of the ABSTRACT and ABS. HOLD files

3. Generates all keywords:

   - from the holding file "HOLD"
   - into their searchable lists in the Catalog.

OVERNIGHT is typically performed overnight, hence its name.

Operator interaction in OVERNIGHT consists of:

-Preparing the magnetic tape device.

-Initiating the OVERNIGHT function (which typically runs unattended)

-Examining the hard-copy output of OVERNIGHT for completeness and possible problems.

Note that OVERNIGHT is normally initiated from a hardcopy terminal.

The HOLD-SAVE tape may be used to restore the saved contents to the holding file ("HOLD") via the funciton HOLD-RESTORE.

B. OPERATING PROCEDURE

1. Type "OVERNIGHT" followed by NEWLINE at the executive prompt dash (-).

2. The operator must mount a magnetic tape and respond to system messages in three places as indicated in the following reproduction of a system.

```
                    OVERNIGHT RUN
                    UPDATING MEDIA DATA BASE

MOUNT A MAGNETIC TAPE ON THE TAPE UNIT

WHEN THE TAPE IS READY ANDONLINE PRESS NEWLINE :

1 ITEM DUMPED.

NOW CHECKING FOR PARITY ERRORS

(94) END OF FILE
```

IF NO "PARITY" ERRORS WERE PRINTED ABOVE, TYPE 'OK NEWLINE OK'

PLEASE DISMOUNT THIS TAPE, MARK IT WITH TODAYS DATA:

2.8 HOLD-RESTORE

A. Introduction

The HOLD-RESTORE function will read a "HOLD" magnetic tape, created for back-up by the OVERNIGHT program, and re-load it to the "HOLD" file on disk. The "OVERNIGHT" program may then access this file to update the data base. This is normally done only when a system failure has forced the use of a previously saved version of the system (from tape or disk) which has not had this "HOLD" information added to it.

Extreme caution must be used if it becomes necessary to use this procedure. When the "HOLD" file is written to tape ALL the contents of the file are written. This includes "reviewed" items and those not reviewed. When HOLD-RESTORE is run, all of the tape contents replace whatever may have been on the disk "HOLD" file. This will only cause problems if proper sequence is not followed when recovering if more than one "HOLD-RESTORE" tape is to be input.

The proper sequence to follow in a system recovery are:

1. Restore the system from a back-up system tape or disk.
2. Use "HOLD-RESTORE" to load the oldest hold tape to disk.
3. Run the "OVERNIGHT".
4. Using "HOLD-RESTORE" load the next HOLD tape.
5. Run "OVERNIGHT".
6. Continue this process until all the hold tapes from the time the system save which was used to recover was done until processing is current.

B. Operating Procedure

1. Log in to a display terminal.
2. Mount a magnetic tape on the tape unit.
3. At the executive prompt (-), type

   HOLD-RESTORE (NL)

4. When the job ends, dismount the tape and return it to the file.

2.9 SYNONYMS

A. SUMMARY OF SYNONYMS

"SYNONYMS" is the supervisory function by which lists of keywords synonymous to other given keywords are established and maintained. For a given keyword, the supervisor may:

(A) declare (add) a new synonymous keyword

(B) delete an existing synonymous keyword

(C) modify an existing synonymous keyword

(D) list all existing synonymous keywords

Thus any keyword may have a list of synonymous keywords associated with it.

Synonyms are used only during RESEARCH. If a keyword for which synonyms exist is specified as search criteria during RESEARCH, that keyword is replaced by all its synonymous keywords (including itself) and the search is conducted on the expanded set of keywords.

B. OPERATING PROCEDURE

1. Type "SYNONYM" followed by pressing NEW LINE at the executive prompt.

2. The system will respond by asking if the user wishes to:
   "LIST ALL SYNONYMS? (Y OR N):"

   * A "Y" response will cause the following message to be printed:

   "WHICH LIST?"

   Valid responses are the two letter abbreviation for any of the seven searchable categories.

   All synonyms for the specified list will then be printed and the SYNONYM program will terminate.

* An "N" response will also request that the user specify a list but when then allow various other functions to be performed.

3. If the user elects not to list synonyms the system will still request that a keyword list be specified by displaying the message:

   "WHICH LIST?"

   Valid responses are the two letter abbreviation for any of the seven searchable categories.

4. Based on the response given above, SYNONYM will request that the user specify:

MAIN-KEYWORD=200

A valid response would be any main keyword for which the user desires to declare synonyms or perform some other maintenance function (delete, replace, kill, or list).

If the main keyword does not already exist in the synonym file it will be added and synonymous keywords should be declared for it and the program will go directly to the "ADD" function.

If the main keywrod already exists, any of the available maintenance functions may be performed on it. A main keyword will be automatically deleted from the synonym file if no synonymous keywords are declared for it.

5. Once SYNONYM has been told which list and which main keyword to work with, it then remains to declare the maintenance function desired. To this end the system will display the message:

"ADD, DELETE, REPLACE, KILL, OR LIST? (A,D,R,K,L):"

The user should respond with the letter (A,D,R,K,L) corresponding to the funciton desired. (Note: If the main keyword stated does not already exist on file this message will not print. An "ADD" condition will be assumed and the program will go directly to "A" function-see below.) Following is a summary of the action taken for each response:

"A"- When this response is given the system will further prompt the user by asking:

"NEW SYNONYM? "

Simply type in the synonym desired and press NEW LINE. The "New Synonym: prompt will occur again each time New Line is pressed until all entries are done, pressing New Line without typing anything at the New Synonym prompt will terminate input and re-display the following message;

"ADD, DELETE, REPLACE, KILL, OR LIST? (A,D,R,L,K)"

Responding with any of the above options (A,D,R,L,K) will execute the specified function and will assume that the user wishes to work with the same list adn main keyword as previously specified. Pressing NEW LINE without entering an option will allow a new main keyword to be entered by displaying the message:

"MAIN" KEYWORD"

A new main keyword may then be specified or NEWLINE may be pressed without making any entry in order to specify a new list. If NEWLINE is pressed without entering a new main keyword, the following message will appear:

"WHICH LIST?"

If a new list is specified the user should then refer to step 3 again and the process will continue. Pressing NEW LINE without entering anything at this point will terminate the "SYNONYM" program.

"D"- If the user wishes to delete synonyms within a specified list and main keyword, as indicated by this response, the system will next display the message:

"SYNONYM NUMBER: "

The number of the synonym which is to be deleted is entered, followed by NEW LINE. The same message will then be displayed. A NEW LINE response without entering a synonym number will re-display the following message:

"ADD, DELETE, REPLACE, KILL, OR LIST?
(A,D,R,L,K)"

From this point on, the procedure is the same as that in Item 5 above.

"R"- When the user wishes to replace a current entry in the synonym file the system will ask:

"SYNONYM NUMBER : "

Enter the number of the synonym (followed by NEW LINE) within a given list and main keyword, that is to be replaced. The system will then display the current synonym in the format below and await entry of the new synonym (followed by pressing NEW LINE):

"(n) xxxxxx: yyyy (NEWLINE)"
where n = synonym number, and;
where x = current synonym, and;
where y = new synonym entered by user

the next synonym number will then be requested.
Responding with NEW LINE without entering a number will cause the following message to be re-displayed:

"ADD, DELETE, REPLACE, KILL, OR LIST?
(A,D,R,K,L)"

Please see Item 5 above for instructions on proceeding from this point.

"K"- This response indicates that the user wishes to completely eliminate a main keyword and its synonyms. The system verifies this by asking:

"ARE YOU SURE? (Y OR N)"

If a "Y" response is given, further verification is requested when the following message is displayed:

"MAIN-Keyword="

Enter the keyword followed by NEW LINE. If an "N" response is given, or when the operation is completed, the system re-displays:

"ADD, DELETE, REPLACE, KILL, OR LIST?
(A,D,R,K,L)"

Again see Item 5 for further instructions at this point.

"L"- This option will simply list all synonyms for the specified list and main keyword and return to the following message:

"ADD, DELETE, REPLACE, KILL, OR LIST?
(A,D,R,K,L)"

Again see Item 5 for further instructions.

C. ALLSYNS

This special program is provided to produce a list of all synonyms on file. It is normally run on a hardcopy terminal. To execute the Program simply type "ALLSYNS" (NL) at the executive prompt.

2.10 CLEAR LOCKS

A. Introduction

The MICRO 4000 System allows multiple users to interactively access the same data base. It is necessary, however, to prevent two users from attempting to update the same data item at the save time. A system of "locks" is used to control access to data. On occasion these locks may not "unlock" properly. This will be indicated by error messages or the inability of terminals to access the system. If this occurs execute the following procedure.

B. Operating Procedure

1. Log in to a display terminal.

2. At the executive Prompt (-), type:

CLEAR-LOCKS (NL)

2.11 LIST-AUTH

This procedure produces a sorted listing of the AUTHORITY file.

To Run:

1. At the executive prompt (-) enter:

   LIST-AUTH ⟨NEWLINE⟩

2. You will be asked:

   IS LISTING FOR MAG TAPE, TERMINAL, OR PRINTER?

   (M/T/P)

   Valid responses are:
   a. "M" to produce a mag tape. A tape should be ready on the drive prior to starting.
   b. "T" for terminal. This should be a hard-copy terminal.
   c. "P" for the printer.

SECTION 3

SYSTEM MAINTENANCE FUNCTIONS

3.1 SAVE400
3.2 FAST-SAVE
3.3 SYSTEM RESTORE
3.4 POWER UP
3.4 POWER DOWN
3.6 PASSWORD CHANGING/SYSTEM RE-GEN.
3.7 MAGNETIC TAPE HANDLING
3.8 MISCELLANEOUS
3.9 PACK COPY

3.1 SAVE400

A. Introduction

SAVE400 is a back-up procedure which will write the entire contents of the system as it exists on disk to magnetic tape in a highly structured format. On a large system this can be a very time consuming process. Disk pack copies are normally used for back-up in these cases. However, it is advisable to take an occasional tape back-up as time allows-at least monthly.

B. Operating Procedure

a. Log in to SYSPROG on hardcopy terminal at channel zero.

b. Place a write ring in a 10.5 inch tape and mount it on the tape drive.

c. Type SAVE400.

d. The program will eject the page and produce a listing of users currently logged-in (The WHO function), and also tell you who you are. The question will then be asked:

IS EVERYONE (EXCEPT YOU) LOGGED OFF? (Y/N)

If your answer is "N" the program will print:

OTHERS SHOULD BE LOGGED OFF TO DO A SAVE400!

and then return to the executive prompt. If you answer "Y" the program will proceed with the save. NOTE: You may answer "Y" to the above question even if other users are on the system if you note the restriction given in C below.

e. If the save takes more than 1 mag. tape the following will happen at the end of each full tape:

The system will rewind the tape and print:

MOUNT REEL #02

You must mount and ready the next tape then:

1. Depress and hold down both the "SHIFT" and CTRL" keys
2. Hit "DELETE" key (do not hold down)
3. Release both the "SHIFT" and "CTRL" keys

The system will then continue with the save.

3.2 FAST400

A. Introduction

This program does the same thing as SAVE400 except that it writes the data to tape in a completly unstructured format. As a result, it runs considerably faster than SAVE400. The result is not as useful as a SAVE400 tape in that selective restores of files cannot be done.

B. Operating Procedure

This procedure is the same as SAVE400 except the program FAST400 is entered at the executive prompt.

3.3 SYSTEM RESTORE

A. Introduction

System Restore is the procedure by which a back up tape generated by SAVE400 or FAST400 is loaded back to disk. It is also used to "boot up" the system if it is necessary to re-load programs, do a cold-start or perform a Reality off-line diagnostic.

The save tape is also used to re-configure the system if necessary and a special restore procedure is provided to accomplish this. In all respects, the save tape is the Master back up version of the system and should be protected.

B. Operating Procedure - Standard Restore from SAVE400 Tape

1. If the system is powered down, execute steps 1 thru 7 of the power-up procedure.

2. Turn the front panel key to "ON" and press the front panel switch "INT". The red "HALT" light should come on. (No terminals should be logged in.)

3. Mount the System Save tape on the tape drive and insure that the hardcopy terminal on channel zero is on.

4. Set front panel switches 1 and 4 to the down position.

5. Press the front panel switches "CLOCK", "RESET", and "INT" <u>in that order</u>. The tape should begin to move.

6. The tape will sop moving after a few minutes and the following message will display:

   "OPTIONS (X/A/AF/F)="

   Valid responses are:
   a. "X" - Monitor cold-start only.
   b. "A" - load programs (ABS) only.
   c. "AF" - Full restore of system (files, ABS, & COLD START)
   d. "F" - Files only.

7. The tape will begin moving. Turn the front panel key to lock and move the switches to the up position.

8. After about 10 minutes (if doing a full restore) the system will request:

   "FRAME-LIMITS:"

   Valid responses are:
   a. "1056-650369 (for a 2 disk 400mb system)
   b. "1056-655955 (for a 4 disk 400mb system)

9. The restore will run unattended from this point for three to four hours.

   NOTE: If the restore is from more than 1 mag tape the following will happen at the end of each full tape: The system will rewind the tape and print:

   MOUNT REEL #02

   You must mount and ready the next tape, then:

   a. Depress and hold down both the "SHIFT" and "CTRL" keys.

   b. Hit the "DELETE" key (do not hold down)

   c. Release both the "SHIFT" and "CTRL" keys

   The system will then continue with the restore.

10. When the system has been loaded, the channel Zero terminal will type:

    "Spooler Started"
    "Please Log In"

11. Rewind and dismount the tape.

12. Log in ot SYSPROG

13. Execute the Cold-Start procedure as follows:

    TYPE-"COLD-START" (NL)

    The following messages will print out. Respond as approriate at the points underlined below:

```
-COLD START
THE CURRENT SYSTEM TIME AND DATE IS 10:33:35 25 OCT 1976
DO YOU WISH TO CHANGE THE TIME OR DATE? (Y/N)? Y
TIME=14:14 (military time)
14:14:01 25 OCT 1976
DATE=10/26/76
14:14:08  26 OCT 1976

ALL CURRENT LOG ON ENTRIES HAVE BEEN CLEARED FROM THE ACCOUNTING FILE

STANDARD -2613 RATES ARE--2400 BAUD (LOCAL)
                          300 BAUD (DIAL-UP)
DO YOU WISH TO SET A -2613 LINE TO A NON-STANDARD RATE (Y/N) N

HOW MANY PAGES ARE TO BE EJECTED AT THE END OF A LISTING? (0,1,2,3,4,5,)

2

YOU ARE NOW BEING LOGGED OFF
PLEASE LOG IN:
```

C. Restore of a FAST400 save tape

Restore using a FAST400 save is the same as a standard restore except for the "OPTIONS" message. In this case the message will read:

"OPTIONS (X/B)"

Valid responses are:
"X" - Monitor cold-start only
"B" - Full restore.

D. System Restore and Reconfiguration

This method of restoring provides an opportunity to alter system characteristics or run the reality off-line diagnostics.

The procedure differs from the standard restore only slightly. Refer to the standard SAVE400 restore procedures and respond differently in these places:

1. At step 4 of the standard procedure set switches 1,2, and 4 to the down posisiton.

2. Prior to the "OPTIONS" message in step 6, the following message will print out. The responses indicated and underlined are the standard ones for the system as delivered.

```
DO YOU WANT TO ROD THE DISK DRIVES? (Y/N) N
NUMBER OF DISK CONTROLLERS 1
NUMBER OF DISKS PER CONTROLLER 2
CORE SIZE 64
MAXIMUM FID 650369
NUMBER OF ENTRIES IN IOQ TABLE 4
NUMBER OF DISK READS BEFORE REMOVAL FROM IOQ 40
NUMBER OF COMMUNICATIONS LINES 17
IS CONFIGURATION CORRECT (Y/N) Y
```

The restore will now proceed with step 6.

E. ROD - REALITY OFF-LINE DIAGNOSTIC

ROD is an off-line disk diagnostic technique. It is run using a SAVE400 tape and executing the reconfiguration option of the restore procedure. It should only be run with a hardware technician in attendance.

The procedure for running ROD is the same as a restore in the reconfiguration mode (See "D" above) until step 6. At this point the reconfiguration messages will appear. Move front panel switch 1 to the up position. At the following message:

DO YOU WNAT TO ROD THE DISC DRIVES (Y/N)

Respond "Y".

The following messages will appear; respond as underlined:

"ENTER DEVICE ADDRESS" 14

"ENTER UNIT NUMBER" 0 or 1 (depending on which drive is to be checked.)

"ENTER HIGH FID TO ROD" 325184 (for a full 200mb disk)

"ENTER NUMBER OF FID'S PER CYL" 399 (for 200mb disk)

"ENTER ROD CODE" 0 or 1 or 2 or 3

Notes:

1. Rod codes are:
   a. "0" Read
   b. "1" Verify
   c. "2" Write
   d. "3" Format

2. If ROD codes 2 or 3 are used, the entire system must be restored after ROD.

3. ROD will run approx. 22 min per 100mb.

4. Pressing the "STEP" switch will restart the ROD program. It will return to the "ENTER DEVICE ADDRESS" message and another drive may be checked if required.

5. When ready to resume normal processing it is necessary to do a system restore with the "X" (monitor cold-start) option unless the ROD code used was 2 or 3. In this case a full restore must be done or a disc back-up system mounted.

3.4 POWER UP

1. Switch the white circuit breaker at the bottom rear of the MICRO 4000 to the "up" position if it is not in that position already.

2. Insert the front-panel key and hold the "RESET" switch down while turning the key to the "on" position; then release the "RESET" switch. The "HALT" light should be on.

3. Press the disk START/STOP button to START. (A disk pack must be mounted in the disk drive).

4. The Ready Light should light up within 30 seconds.

5. Check the READ ONLY switch; it should not be depressed. For normal operation it should be set on R/W.

6. Press the POWER button on the disk controller (at bottom front of the MICRO 4000 main frame).

7. Press and release the front-panel "Reset" switch.

8. All sense switches in normal position (UP).

9. Press the front-panel "INT" switch. The "RUN" light should go on.

10. Turn key to the lock position and remove it. The system is now ready for log on.

3.5 POWER-DOWN

1. Insure that all stations are logged off and powered down except one.
2. Type "FLUSH-CORE" in SYSPROG user name and wait approximately 1-3 minutes.
3. All executive prompt will be typed when ready (-).
4. Insert front panel key and turn it from "LOCK" to "ON".
5. Press and release the front-panel "INT" switch; the "HALT" light should come on. Hold reset switch down, while turning front panel key from "ON" to "OFF". Remove key.
6. Press the disk START-STOP button; the Ready light will go off. Do nothing else until packs stop turning.
7. After packs stop press the POWER button on the disc controller.
8. Switch the white circuit breaker at the bottom rear of the MICRO 4000 to the down (off) position.

1.6 PASSWORDS/SYSTEM RE-GEN

A. PASSWORD CHANGING

To change a password the supervisor must log into the user name called SYSPROG and use the password program.

Type "PASSWORD" ⟨NEW LINE⟩

The following messages should then be responded to:

1. Master Password:
2. Change password or change master password (P or M):
3. Enter password:
4. Again enter the password:
5. Enter name of user:

The program will ask for a master password. This is the password that is required before a password may be altered. Once this master password is entered the user passwords of any user may be altered.

To alter a user password the letter P is used. To alter the master password the letter M is used. The program asks you to enter the master password which must all be control characters so that a printed record does not remain. The program then asks you to type it a second time to assure that it has been entered correctly.

The user name to which this password is to be attached is the requested. If the name does not exist an error message will print.

Note: It is wise to change passwords after personnel have left your organization.

The control characters M,N,X and W should not be used in passwords and control A,H,K, and R should be used carefully.

B. SYSTEM RE-GEN

1. Log into SYSPROG
2. Execute "RE-GEN" by typing "RE-GEN"
3. Answer "Y" to the question "ARE MONITOR MODES LOADED?"
4. Use the appropriate re-configuration parameters to answer the remaining questions.

This program is run when the system has been re-configurated during SYSTEM-RESTORE and it is desired to make the new configuration permanent.

3.7 MAGNETIC TAPE HANDLING

Good quality magnetic tape in 10.5 inch reels should be used with the MICRO 4000 system. The presence of a write ring is required for the system to write on the tape. Write rings should be removed immediately after a tape has been written.

Mounting Tapes

1. Clean read/write heads, rollers and capstan.

2. Open the latch on the upper hub, then fit the reel over the latch.

3. Thread the tape as described in the diagram which is located behind the door. Leave no slack in the tape. Now close the door.

4. Press the power button, then press the load button twice. The tape does not halt after a short length of tape has moved, it has gone beyond the load point. If this happens then press the rewind button and it will automatically return to the load point.

5. Press the on line button.

Dismounting Tape.

1. Press ON LINE, then rewind. If the tape was not at the load point then press the rewind button again.

2. When the tape stops, open the door andmanually wind the remaining tape onto the upper reel. Remove reel and turn the power off.

3. If it is necessary to mount a second reel for a job the system will display a message and await reply. Mount the second reel and simultaneously press CONTROL, SHIFT, and "0" (if on a DECWRITER press CONTROL, SHIFT, DELETE).

3.8 MISCELLANEOUS (USER IDENTIFICATION, RIP OPTION, SYSTEM ACCOUNTING)

1. User Identification
   The System Supervisor may identify all active users and their corresponding channel numbers by logging in to SYPROG and typing:

   -WHO ⟨NEW LINE⟩

   His own channel number may be verified at any time by typing:

   -ME ⟨NEW LINE⟩

   (The WHO and ME functions are also available in other accounts.)

2. RIP OPTION
   Ocasionally, a user terminal may not be logged off the system due to a malfunction or by taking it off line without going through the log-out procedure. When this occurs, the user job remains present and running in the Micro 4000. To stop the job the supervisor should:

   a. Log in to SYSPROG

   b. Identify the user channel by utilizing the WHO command.

   c. KILL the job by typing:
      -RIP n (where n=channel number of user who was not logged off)

3. SYSTEM ACCOUNTING
   The system maintains an accounting file of user activity which includes:

   -Date and time logged in
   -Connect time
   -CPU usage
   -Charges (calculated at the rate of $6.48 per connect hour and $.05 per CPU unit)

   This file will continue to grow until cleared by supervisor action. The following commands are available to provide an accounting report capability and clear the files:

   a. ACC-DETAIL - This command produces a formatted report of all accounting data on the terminal.

   b. ACC-SUMMARY- As above, but summary only

   c. ACC-CLEAR - Clears accounting file. No other terminal should be logged in. Should be used at least monthly.

3.9 PACK COPY

A. Introduction

This procedure describes how to copy system disk packs to back-up packs for system security. It is important that this function be done on a regular and frequent basis. The back up disks should be as current as possible in order to minimize recovery time in the event of a system failure.

The procedure utilizes manual switches built into the disk controller which is built into the disk controller which is located in the lower portion of the Central Processing Unit. It is important that this procedure be fully understood and carefully followed. It takes approximately 45 minutes to copy one 200mb disk pack.

B. Operating Procedure

1. This procedure uses manual switches located on the front of the disk controller. There are eight switches numbered from left to right as 8,7,6,5,4,3,2,1.

2. No other activity can take place on the system while pack copies are being done.

3. Packs are always copied from Drive one to Drive zero. There are removable plugs on each drive which identify them. It is very important that the system packs themselves are kept on their relative drives when running the system. For example, if Disk pack A is normally on drive zero and Disk pack B is normally on drive one when the system is in operation, the copy packs must be similarly identified. The system will not operate if the packs are switched around.

4. Labels should never be placed on the packs themselves. Only on the covers.

5. To copy packs: (all controller switches down)
   a. Press CPU front panel switches "HALT", "INT", "RESET.
   b. Place a new pack on Drive Zero and set the Read-Write switch to R/W.
   c. Place the pack to be copied on drive one and set the read-write switch to Read only
   d. Power up the drives.
   e. Set controller switches 2,3,4,6 to the up position. (caution switch 7 must be down)
   f. When disks are ready press the CPU front panel switch "RESET".
   g. Place controller switch 8 to the up position.
   h. The pack copy has now started. The bottom half of the disk controller power light will go out and remain out for approx. 40 minutes.
   i. When the pack is being verified (after about 40 min.) the bottom half of the disk controller power light will flicker slightly for approx. 4.5 min.

j. When the bottom half of the power light is glowing solidly (no flicker) the pack copy is finished.
k. Label the disk pack covers carefully.
l. Power down the disk drives.

6. If another pack is to be copied mount the packs on the proper drives and go back and execute steps "b" thru "f".

7. When pack copies are complete place all controller switches in the down position.

When you are ready to bring the system up mount the system packs on the drives being very careful to get the proper pack on the proper drive and power up the drives. Then:

a. Place both Read/Write switches in the R/W position.
b. Mount the latest system save tape.
c. Follow the system restore procedure for an "X" option restore followed by a "COLD-START". This should also be done any time back-up packs are brought up on the system for recovery of failure.